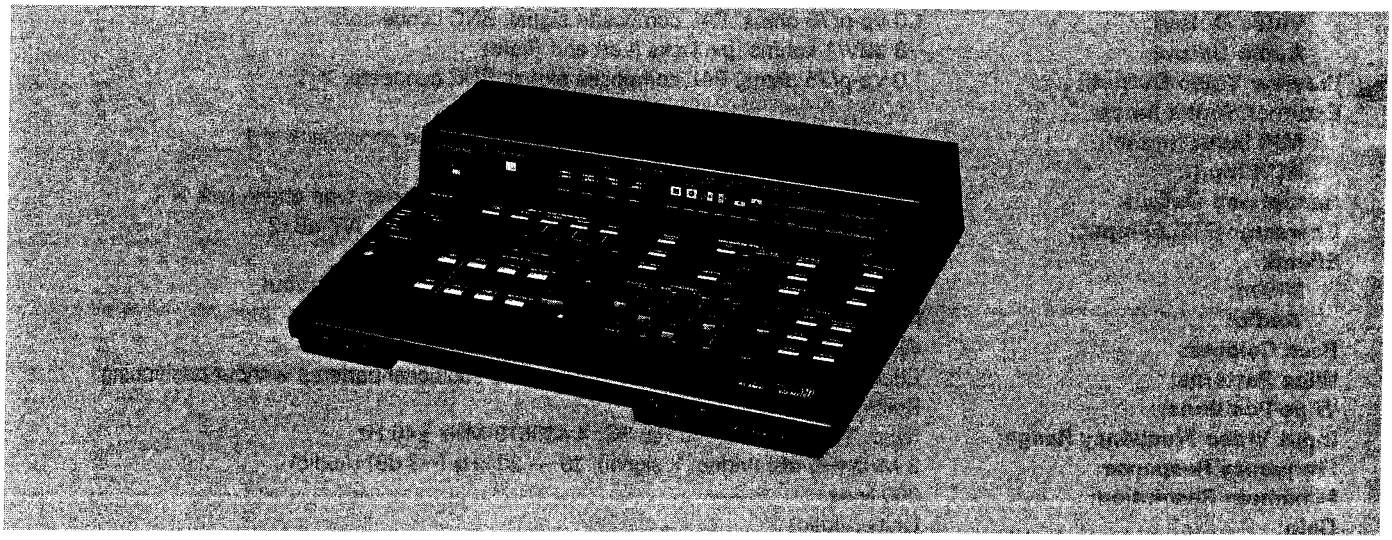
ORDER NO. AVS88052097C8

3515

Service Manual

Production Mixer
WJ-MX10



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SM-WJMX10E 1 ST
SVC MNL

Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

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SPECIFICATIONS

Source Input:	×2 (SOURCE 1 and SOURCE 2)
Video Input:	1.0 Vp-p/75 ohms or high impedance loop-through, PAL composite signal, BNC connectors
Audio Input:	−10 dBV/15 kohms, pin jacks (Left and Right)
External Camera Input:	1.0 Vp-p/75 ohms CCIR or PAL composite signal, BNC connector × 1
Sync Output:	1.0 Vp-p/75 ohms, composite sync, BNC connector × 1
Recording Output:	×2 (REC OUT 1 and REC OUT 2)
Video Output:	1.0 Vp-p/75 ohms, PAL composite signal, BNC connectors
Audio Output	−8 dBV/1 kohms, pin jacks (Left and Right)
Preview Video Output:	1.0 Vp-p/75 ohms, PAL composite signal, BNC connector × 1
External Sound Input:	
MIC Input (mono):	−60dB/600 ohms, unbalanced, tip-ring-sleeve type phono jack × 1
AUX Input:	−10 dBV/15 kohms, pin jacks (Left and Right)
Headphone Output:	−30 dB/8 ohms, (8 ohms — 100 ohms), tip-ring-sleeve type phono jack × 1
Character (TITLE) Input:	10-pin connector × 1 for optional Character Generator WV-KB12
Effects	
Video:	Still, Strobe, Mosaic, Paint, Mix, Wipe, Superimpose, Fade-in/out
Audio:	Mix, Fade
Back Colours:	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
Wipe Patterns:	Circle and Square with positioning, and 15 additional patterns without positioning
Wipe Positioner:	Built-in Joystick Positioner
Input Video Frequency Range:	Sync: 15,625 kHz ±300 Hz, SC: 4.433619 MHz ±40 Hz
Frequency Response:	3 MHz (−3 dB) (Video, Y signal), 20 — 20 kHz (−3 dB) (Audio)
Maximum Resolution:	300 lines
Gain:	Unity (Video)
Signal-to-noise Ratio:	More than 46 dB (Video), 50 dB (Audio)
Differential Gain:	±10%
Differential Phase:	±7°
Power Source:	240 V AC, 50 Hz for WJ-MX10/A and WJ-MX10/B; 220 V AC 50 Hz for WJ-MX10/C and WJ-MX10/G
Power Consumption:	35 W
Ambient Temperature:	0° — 40° C
Ambient Humidity:	Less than 90%
Dimensions:	420 (W) × 100 (H) × 327 (D) mm
Weight:	5.5kg

Weight and dimensions indicated are approximate.
Specifications are subject to change without notice.

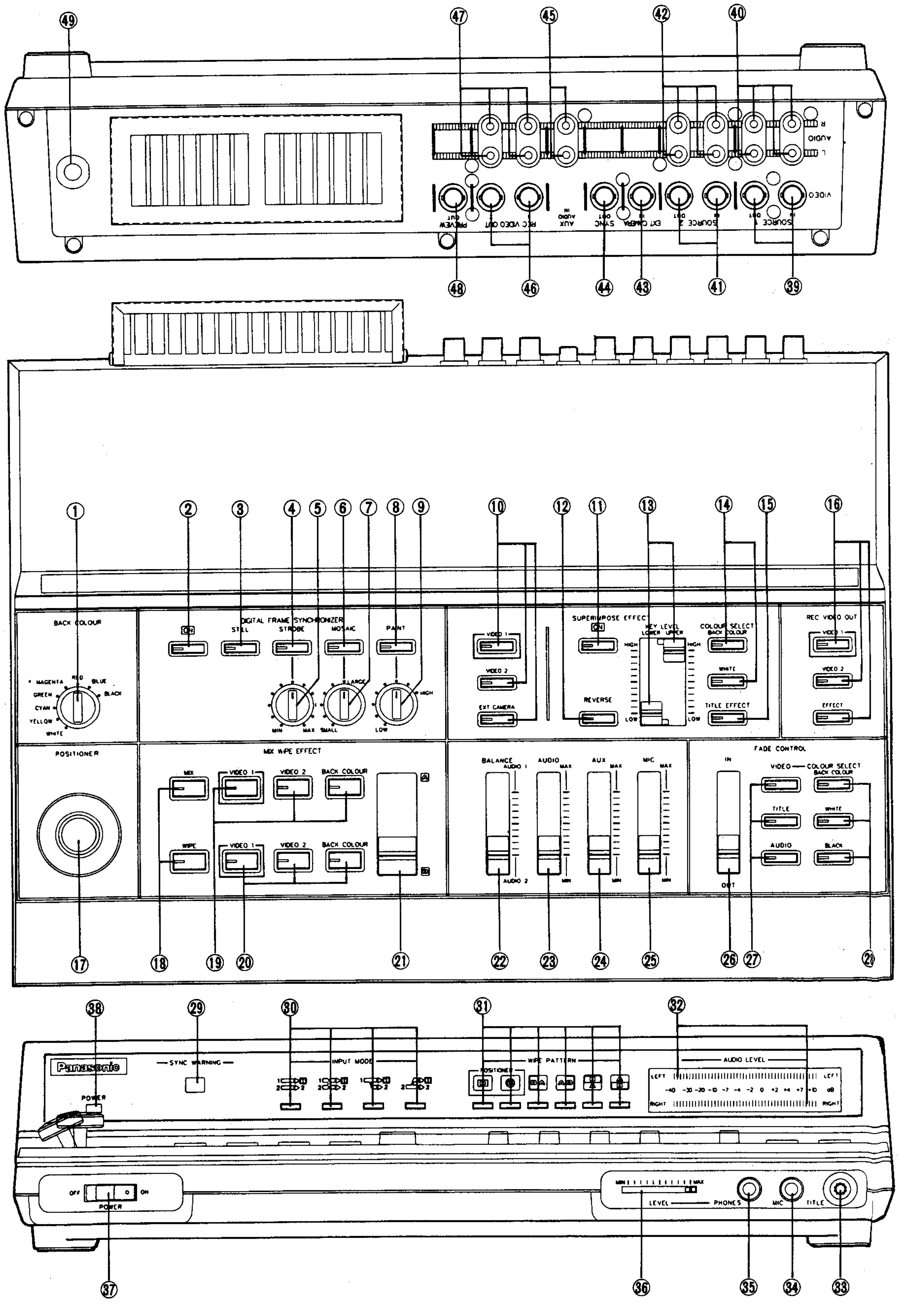
STANDARD ACCESSORIES

- Mounting Base for Character Generator WV-KB12

OPTIONAL ACCESSORIES

- Character Generator WV-KB12

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



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AUDIO
R
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VIDEO
PREVIEW OUT
REC VIDEO OUT
AUX AUDIO IN
SYNC OUT
EXT CAMERA IN
SOURCE 2 OUT IN
SOURCE 1 OUT IN
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⑮
⑯
BACK COLOUR
MAGENTA
RED
BLUE
GREEN
BLACK
CYAN
YELLOW
WHITE
DIGITAL FRAME SYNCHRONIZER
ON
STILL
STROBE
MOSAIC
PAINT
MIN
MAX
SMALL
LARGE
LOW
HIGH
VIDEO 1
VIDEO 2
EXT CAMERA
SUPERIMPOSE EFFECT
ON
REVERSE
KEY LEVEL
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UPPER
HIGH
LOW
COLOUR SELECT
BACK COLOUR
WHITE
TITLE EFFECT
REC VIDEO OUT
VIDEO 1
VIDEO 2
EFFECT
POSITIONER
MIX WIPE EFFECT
MIX
WIPE
VIDEO 1
VIDEO 2
BACK COLOUR
A
B
BALANCE
AUDIO 1
AUDIO 2
AUDIO
AUX
MIC
MAX
MIN
FADE CONTROL
IN
OUT
VIDEO
COLOUR SELECT
BACK COLOUR
TITLE
WHITE
AUDIO
BLACK
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Panasonic
POWER
SYNC WARNING
INPUT MODE
WIPE PATTERN
POSITIONER
AUDIO LEVEL
LEFT
RIGHT
-40 -30 -20 -10 -7 -4 -2 0 +2 +4 +7 +10 dB
OFF
ON
POWER
MIN
MAX
LEVEL
PHONES
MIC
TITLE
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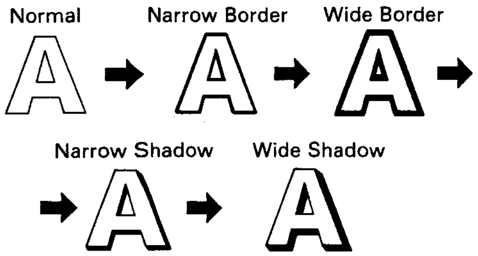
15. Title Effect Switch (TITLE EFFECT)

By depressing this switch, the superimposed titles can be changed as follows:

→ Normal → Narrow Border → Wide Border →
→ Narrow Shadow → Wide Shadow ⏌



16. Recording Video Output Selection Switches (REC VIDEO OUT, VIDEO 1/VIDEO 2/EFFECT)

These switches are used to select the output video signal of the REC VIDEO OUT connectors ㊻ on the rear panel as follows.

VIDEO 1: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚ and the digital frame synchronizer, is selected.

VIDEO 2: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚, is selected.

EFFECT: The special effects video signal (superimpose, wipe/mix or fade) is selected.

17. Joystick Positioner (POSITIONER)

The position of the circle and square wipe patterns as selected using the Wipe Pattern Selection switches ㉛ can be freely set using this joystick.

18. Mix/Wipe Mode Selection Switches (MIX/WIPE)

These two switches are used to select the Mix or Wipe mode.

19. A-bus Input Selection Switches (🄰, VIDEO 1/VIDEO 2/BACK COLOUR)

These switches are used to select the allocation of the video signal to the A-bus input.

VIDEO 1: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚ and the digital frame synchronizer, is selected.

VIDEO 2: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚, is selected.

BACK COLOUR: The background colour signal set by the Back Colour Selection switch ① is selected.

20. B-bus Input Selection Switches (🄱, VIDEO 1/VIDEO 2/BACK COLOUR)

These switches are used to select the allocation of the video signal to the B-bus input in addition to the A-bus Input Selection switches ⑲.

21. Wipe/Mix Lever (🄰, 🄱)

In the wipe mode, moving this lever from A to B will increase the portion of the B input, and vice versa.
In the mix mode, video images are switched between A and B.

22. Balance Control (BALANCE, AUDIO 1/AUDIO 2)

This control is used to balance the mixed audio signal fed to SOURCE 1 (AUDIO 1) input connector and the signal fed to SOURCE 2 (AUDIO 2) input connector on the rear panel.

23. Audio level Control (AUDIO, MAX/MIN)

This is the overall attenuator for the mixed AUDIO 1 and AUDIO 2 sound.

24. Auxiliary Audio Level Control (AUX, MAX/MIN)

This is the input attenuator for the auxiliary audio signal fed to the AUX AUDIO IN connectors ㊺ on the rear panel.

25. Microphone Level Control (MIC, MAX/MIN)

This is the input attenuator for the microphone signal fed to the MIC input jack ㉞.

26. Fade Lever (IN/OUT)

Moving this lever from OUT to IN, fade-in of the sound takes place. Fade-out is accomplished by moving the lever from IN to OUT.

27. Fade Control Switches (VIDEO, TITLE, AUDIO)

These switches are used to select the fade mode as follows.

	VIDEO	TITLE	AUDIO
VIDEO fade	ON	OFF	OFF
TITLE fade	OFF	ON	OFF
AUDIO fade	OFF	OFF	ON
VIDEO & AUDIO fade	ON	OFF	ON
VIDEO & TITLE fade	ON	ON	OFF
TITLE & AUDIO fade	OFF	ON	ON
VIDEO & TITLE & AUDIO fade	ON	ON	ON

28. Colour Selection Switches (COLOUR SELECT, BACK COLOUR/WHITE/BLACK)

These switches are used to select the colour for the fade-out mode as follows.

BACK COLOUR: The back colour signal set by the Back Colour Selection switch ① is selected.

WHITE: The image will fade out in white.

BLACK: The image will fade out in black.

1. **Back Colour Selection Switch (BACK COLOUR)**
   This control is used to select the background colour for MIX, WIPE, SUPERIMPOSE and VIDEO FADER operations.
   One out of the following eight background colours can be chosen: White, Yellow, Cyan, Green, Magenta, Red, Blue and Black.

2. **Digital Effect ON/OFF Switch (ON)**
   This switch is the Master ON/OFF switch for the digital effects, such as STILL, STROBE, MOSAIC and PAINT
   Note: The digital effects are available only for VIDEO 1 as indicated in the box, and not for VIDEO 2.

3. **Still ON/OFF Switch (STILL)**
   This switch is used to freeze the VIDEO 1 picture.
   Pressing this switch once, the VIDEO 1 image will freeze and the LED indicator in the switch lights. To return to a 'live' picture, press the switch once more. The LED indicator goes out.

4. **Strobe ON/OFF Switch (STROBE)**
   This switch is used to obtain a strobe effect of the VIDEO 1 picture.
   Pressing this switch once, strobe effects are applied to the VIDEO 1 image and the LED indicator in the switch lights. The time interval of the strobe effect can be changed by turning the Strobe Time Interval control ⑤. Adjustment is possible from approx. 0.2 to 2 seconds. To return to a normal picture, press the switch once more. The LED indicator goes out.

5. **Strobe Time Interval Control (MIN/MAX)**
   Turning this control, the time interval of the strobe effect can be freely adjusted from approx. 0.2 to 2 seconds.

6. **Mosaic ON/OFF Switch (MOSAIC)**
   This switch is used to obtain a mosaic effect of the VIDEO 1 picture.
   Pressing this switch once, a mosaic effect is applied to the VIDEO 1 image and the LED indicator in the switch lights. To return to a normal picture, press the switch once more. The LED indicator goes out.

7. **Mosaic Size Selection Control (SMALL/LARGE)**
   The mosaic size can be changed in six steps by using this control.

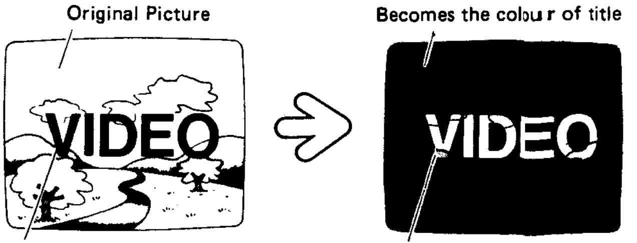
8. **Paint ON/OFF Switch (PAINT)**
   This switch is used to obtain an oil-paint touch effect for the VIDEO 1 picture.
   Pressing this switch once, an oil paint touch effect is applied to the VIDEO 1 image and the LED indicator in the switch lights. To return to a normal picture, press the switch once more. The LED indicator goes out.

9. **Paint Graduation Selection Control (LOW/HIGH)**
   The graduation of paint effect can be changed in 8 steps (1 bit to 8 bits).

10. **Source Selection Switches (SOURCE, VIDEO 1/VIDEO 2/EXT CAMERA)**
    These three switches are used to select the source for the image to be superimposed as follows:
    VIDEO 1: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚ and the digital frame synchronizer, is selected.
    VIDEO 2: The video signal fed to either the SOURCE 1 ㊴ or SOURCE 2 ㊶ connector on the rear panel, as selected by the Input Mode Selection switches ㉚, is selected.
    EXT CAMERA: The video signal fed to the EXT CAMERA IN connector ㊸ on the rear panel is selected.

11. **Superimpose ON/OFF Switch (ON)**
    This is the master ON/OFF switch for the superimpose function.

12. **Reverse Switch (REVERSE)**
    This switch is used to select the polarity of the superimposed key signal.



13. **Key Level Controls (KEY LEVEL, LOWER, UPPER)**
    These two controls are used to adjust the luminance level of the key signal for lower level (black) and upper level (white), respectively for clear superimposed pictures.
    Refer to step 9 of A-2 "SUPERIMPOSE" of the Operating Procedures.

14. **Colour Selection Switches (BACK COLOUR, WHITE)**
    These 2 switches are used to select the colour of the superimposed titles, either white or the background colour selected by the Back Colour Selection switch ①.

Note:

(1) If the input video signal does not meet with the PAL colour standard or the CCIR B/W standard video signal, this could cause a disturbance of synchronization.

(2) In case the S/N ratio of the input signal is very low, this may be reflected in a low- quality picture.

(3) If the input video signal is very jittery, such as in case of the VTR playback picture, this could cause a disturbance of synchronization or colour.
In case the video signal from the VTR and that of the camera is to be mixed, it is recomended to select the camera signal for the VIDEO 2 signal by the Input Mode Selection switches ㉚.

40. Source 1 Audio Connector (SOURCE 1, AUDIO L/R)

−10 dB/15 kohms audio signals for the SOURCE 1 should be supplied to these input (IN) connectors. The input audio signals can be taken out from the output (OUT) connectors with a high impedance loop.

41. Source 2 Video Connector (SOURCE 2, VIDEO IN/OUT)

The IN connector accepts a 1.0 Vp-p/75 ohm composite video signal.

Connecting coaxial cable with a BNC connector to the OUT connector, the high impedance video loop is automatically selected. At all other times, the terminals are automatically terminated by 75 ohms.

Note:

(1) If the input video signal does not meet the PAL colour standard or the CCIR B/W standard, this could cause synchronization error.

(2) In case the S/N ratio of the input signal is very low, this may be reflected in a low-quality picture.

(3) If the input video signal is very jittery, such as a picture played back on a VTR, synchronization or colour error may appear.
In case the video signal from the VTR and that of the camera is to be mixed, it is recomended to select the camera signal for the VIDEO 2 signal by the Input Mode Selection switches ㉚.

42. SOURCE 2 Audio Connectors (SOURCE 2, AUDIO L/R)

The IN connectors accepts a −10dB/15 kohm audio signal.

The input audio signals can be taken out from the output (OUT) connectors with a high impedance loop.

43. External Camera Input Connector (EXT CAMERA IN)

For the key signal in the superimpose mode, this connector accepts a 1.0 Vp-p/75 ohm composite video signal, which is synchronized with the sync output signal provided at the SYNC OUT connector ㊹.

44. Sync Output Connector (SYNC OUT)

A 1.0 Vp-p/75 ohm negative polarity composite sync signal is provided at this connector for synchronization of an external camera.

45. Auxiliary Audio Input Connectors (AUX AUDIO IN)

Accept −10dB/15 kohm audio signals from an external audio source.

46. Recording Video Output Connectors (REC VIDEO OUT 1/2)

A 1.0 Vp-p/75 ohm composite video signal, as selected by the Recording Video Output Selector switches ⑯, is provided at these connectors.

47. Recording Audio Output Connectors)

−8dB/1 kohm audio signals for recording are supplied at these connectors.

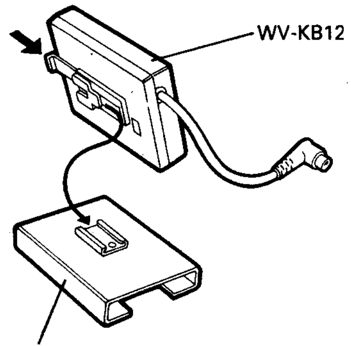
48. Preview Output Connector (PREVIEW OUT)

A 1.0 Vp-p/75 ohm composite video signal of the EFFECT (all effect) image is provided at this connector.

49. Power Cord

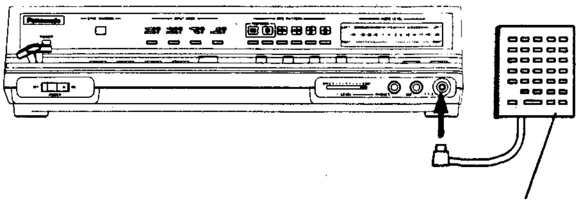
Preparing the Character Generator (optional)

- Mount the optional Character Generator WV-KB12 onto the Character Generator mounting base.



Mounting Base for Character Generator

- Connect the cable of the WV-KB12 to the Title Input Connector ㉝.



29. Sync Warning Indicator (SYNC WARNING)

This LED indicator shows the sync conditions as follows.

Green: The GEN-LOCK sync mode is selected and the sync generator inside the unit is synchronizing the signal with the VIDEO 2 signal.

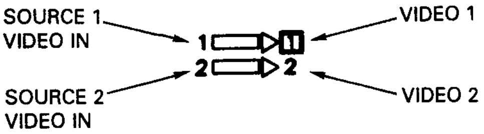
Orange (amber): The Internal sync mode is selected and no video signal is supplied to the VIDEO 2 channel.

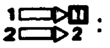
Red: The synchronization is disturbed or unstable. Even if the VIDEO 2 signal is supplied, the sync generator inside cannot synchronize the signal properly because of noise in the VIDEO 2 signal.

Note: If the indicator colour of the indicator changes, check the SOURCE signal for the VIDEO 2 signal whether the synchronization error still exists.

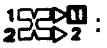
30. Input Mode Selection Switches (INPUT MODE)

These 4 switches are used to select the input mode as follows:

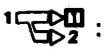




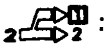
: The SOURCE 1 video signal is used for the VIDEO 1 signal, being passed through the digital frame synchronizer, and the SOURCE 2 video signal is used for the VIDEO 2 signal.



: The SOURCE 1 video signal is used for the VIDEO 2 signal and the SOURCE 2 video signal is used for the VIDEO 1 signal, the latter being passed through the digital frame synchronizer.



: The SOURCE 1 video signal is used for both the VIDEO 1 and VIDEO 2 signal.

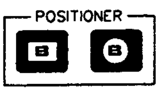


: The SOURCE 2 video signal is used for both the VIDEO 1 and VIDEO 2 signal.

Caution: Do not change the setting of these switches during recording, as this may result in synchronization error.

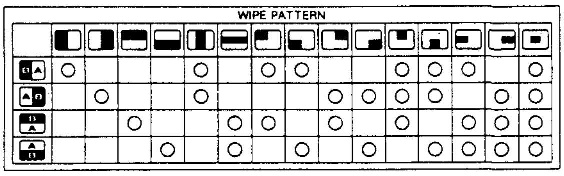
31. Wipe Pattern Selection Switches (WIPE PATTERN)

The wipe pattern can be selected as follows.



Square and circle wipe can be selected with the two switches on the left. Position in this case is done through use of the Joystick Positioner ⑰.

Through combined use of the four switches on the right, the following wipe patterns can be selected. Please note that positioning in this case is not effective.



WIPE PATTERN

	◧	◨	⬒	⬓	◫	⊟	◰	◱	◳	◲	⬒	⬓	◧	◨	▣
B A	○				○		○	○			○	○	○		○
A B		○			○				○	○	○	○		○	○
B / A			○			○	○		○		○		○	○	○
A / B				○		○		○		○		○	○	○	○

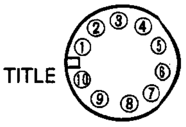
32. Audio Level Indicator (AUDIO LEVEL)

These LED indicators show the output level for the left and right channels, respectively.

33. Title Input Connector (TITLE)

This connector is used to connect the optional Character Generator WV-KB12.

①: Character IN
②: Not used
③: Ground
④: Not used
⑤: Sync out
⑥: Not used
⑦: Ground
⑧: +9V OUT
⑨: Ground
⑩: Not used



Front View

Caution: When WV-KB12 is used with this unit, the following functions of the WV-KB12 are disabled:

1. Stopwatch display
2. Title colour setting
3. Title page display

34. Microphone Input Jack (MIC)

This jack is used to connect a microphone with a tip-ring-sleeve or tip-sleeve type phone plug.

35. Headphone Jack (PHONES)

This jack is used to connect a headphone and the output level can be adjusted by the Headphone Level Control ㊱.

36. Headphone Level Control (LEVEL)

This is level control for headphone output.

37. Power ON/OFF Switch (POWER ON/OFF)

38. Power Indicator (POWER)

39. Source 1 Video Connectors (SOURCE 1, VIDEO IN/OUT)

A 1.0 Vp-p/75 ohm composite video signal should be supplied to the input (IN) connector. Connecting coaxial cables with BNC connectors to the output (OUT) connector, the high impedance video loop is automatically selected. At all other times, the terminals are automatically terminated by 75 ohms.

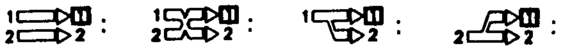
CIRCUIT DESCRIPTION

1. Outline

The WJ-MX10 contains a video mixer and an audio mixer sections as shown in the overall block diagrams.

• Video Mixer Section

The SOURCE 1 and SOURCE 2 video signals through the input mode selection switches



become the VIDEO 1 signal (1⃞) and VIDEO 2 signal (2).

The VIDEO 1 signal is sent to the Y (luminance), C (chrominance) and SYNC separation circuit. The separated Y, R-Y and B-Y signals are fed to analog-digital converters (A/D) so that the Y signal is converted into 8 bits for graduation, 512 bits for 1 line and R-Y & B-Y signals are converted into 8 bits for saturation and 128 bits for 1 line.

The digitalized Y, R-Y and B-Y signals for 1 frame are stored in the memories.

In order to control the write timing of the memories, the separated sync signal is fed to the AFC, GEN-LOCK circuits and the HD and VP (VD) signals for writing memory are fed to the MEMORY circuits.

The stored Y, R-Y and B-Y signals in the memory circuit is read out by the HD and VP (VD) signals for reading memory fed to the memory circuit from the Y, C, SYNC separation circuit for VIDEO 2 signal.

In this way, the sync timing of the VIDEO 1 signal is matched to that of the VIDEO 2 signal.

The read out Y, R-Y & B-Y signals are converted into analog signals by digital-analog converters (D/A) and fed to an encoder circuit to convert them into a composite video signal. This encoder receives the sync and subcarrier signals from the AFC, GEN-LOCK circuit of VIDEO 2 signals in order to match the sync and subcarrier to the VIDEO 2 signal.

The VIDEO 2 signal is sent to the Y, C and SYNC separation circuit as well and Y, R-Y & B-Y signals obtained at the output of Y, C, SYNC separation circuit are fed to the other encoder circuit to generate a composite VIDEO 2 signal.

The composite SYNC signal for the external camera is generated by the AFC, GEN-LOCK of the VIDEO 2 circuit.

The composite video signals from the encoders of VIDEO 1 and VIDEO 2 are fed to the Input Selection Switches for the WIPE/MIX circuit besides the back color video signal from the back color generator circuit.

The video signal from the WIPE/MIX circuit is then fed to the SUPERIMPOSE circuit.

The source signal for the superimpose is selected from the one of the VIDEO 1, VIDEO 2 or EXT CAMERA signal by the Source Selection Switches.

The color of the titles superimposed onto the picture on the picture is selected from either WHITE or BACK COLOR.

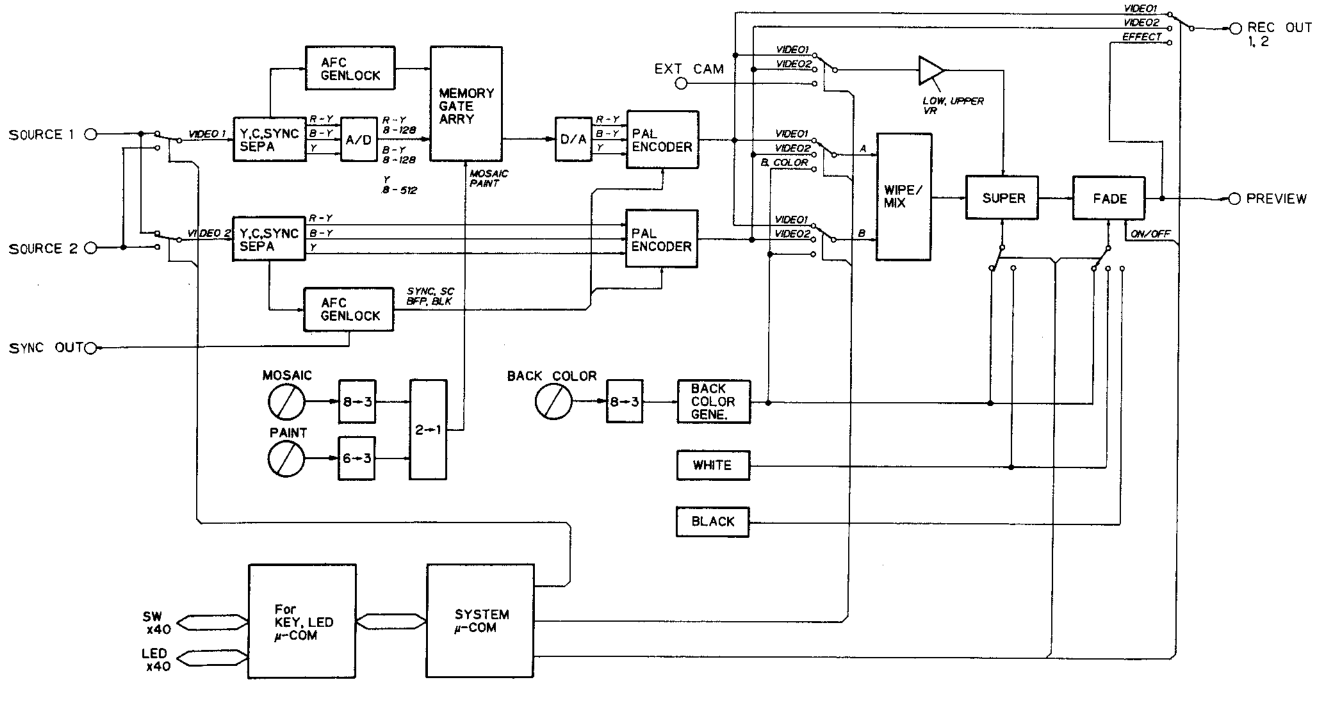

SOURCE 1
SOURCE 2
SYNC OUT
VIDEO 1
VIDEO 2
Y,C,SYNC SEPA
R-Y
B-Y
Y
A/D
AFC GENLOCK
MEMORY GATE ARRY
R-Y 8-128
B-Y 8-128
Y 8-512
MOSAIC PAINT
SYNC, SC BFP, BLK
D/A
PAL ENCODER
EXT CAM
LOW, UPPER VR
B. COLOR
A
B
WIPE/ MIX
SUPER
FADE
ON/OFF
VIDEO1
VIDEO2
EFFECT
REC OUT 1, 2
PREVIEW
MOSAIC
PAINT
8→3
6→3
2→1
BACK COLOR
BACK COLOR GENE.
WHITE
BLACK
SW x40
LED x40
For KEY, LED µ-COM
SYSTEM µ-COM

Fig. 1-1 Video Overall Block Diagram

The output video signal from the superimpose circuit is fed to the FADE circuit.
The picture for the fade-out condition can be selected from the one of the BACK COLOR, WHITE or BLACK by the Colour Selection Switches of the fade circuit.
The output video signal from the fade circuit is provided at the PREVIEW output connector and sent to the REC VIDEO OUT 1, 2 connectors through the Recording Video Output Selection Switches.
The digital frame synchronizer (memory) is only employed for the VIDEO 1 (not source 1) signal as shown in the diagram and thus the STILL, STROBE, MOSAIC and PAINT effects are available for the VIDEO 1 signal.

(a) STILL
The memory writing is stopped and the last data in the memories is read out as for the VIDEO 1 signal.
In this case, the last data in the odd field memories is read out for both the odd and even field for the field still (not frame still) function.

(b) STROBE
The memory writing is done by the time set by the Strobe Time Interval Control (approx. 0.2 to 2 seconds) and the data in the odd field memories is read out for both odd and even field.

(c) MOSAIC
The memory writing is done same as normal mode and the read out is done in 1/2, 1/4, 1/8, 1/10, 1/32 (1 bit out of 32 bits) in horizontal and 1, 1/2H, 1/4H, 1/8H, 1/16H (once in every 16H lines) in vertical direction.

(d) PAINT
The writing and reading memory for C (chrominance) signal are same as normal condition and that of Y signal is changed from Y1 ~ Y8 (LOW), Y2 ~ Y8, Y3 ~ Y8, Y4 ~ Y8, Y5 ~ Y8, Y6 ~ Y8, Y7 ~ Y8 and Y8 only (HIGH) so that the graduation of Y signal becomes 256 steps (LOW), 128 steps ---- 4 steps and 2 steps (HIGH) by the Paint Graduation Selection Control.
The Control or Selection signal from the 40 switches on the top panel is detected by the "For KEY, LED µ-COM" (KEY, LED microprocessor) and sent to the corresponded switches through the "SYSTEM µ-COM" (system microprocessor).

• Audio Mixer

The stereo input audio signal of the SOURCE 1 and SOURCE 2 are fed to the BALANCE control and overall level of SOURCE 1 and SOURCE 2 signal is adjusted by the AUDIO control.
The stereo auxiliary audio signal and monaural microphone audio signal are controlled by the AUX and MIC control respectively and are mixed to the source audio signal.

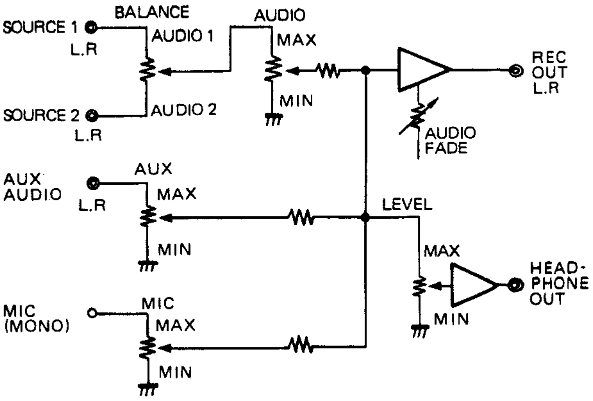


Fig. 1-2 Audio Block Diagram

The WJ-MX10 contains following printed circuit boards.

- Sync board
- Mixer board
- Control board
- Switch board
- Meter board
- Power board etc.

2. Sync Board

This board contains following circuits.

- V1 (VIDEO 1) Demodulator circuit
- V1 A/D Converter circuit
- Memory circuit
- V1 D/A Converter circuit
- V1 Modulator circuit
- V2 (VIDEO 2) Demodulator circuit
- V2 Modulator circuit
- Sync Warning Detector circuit

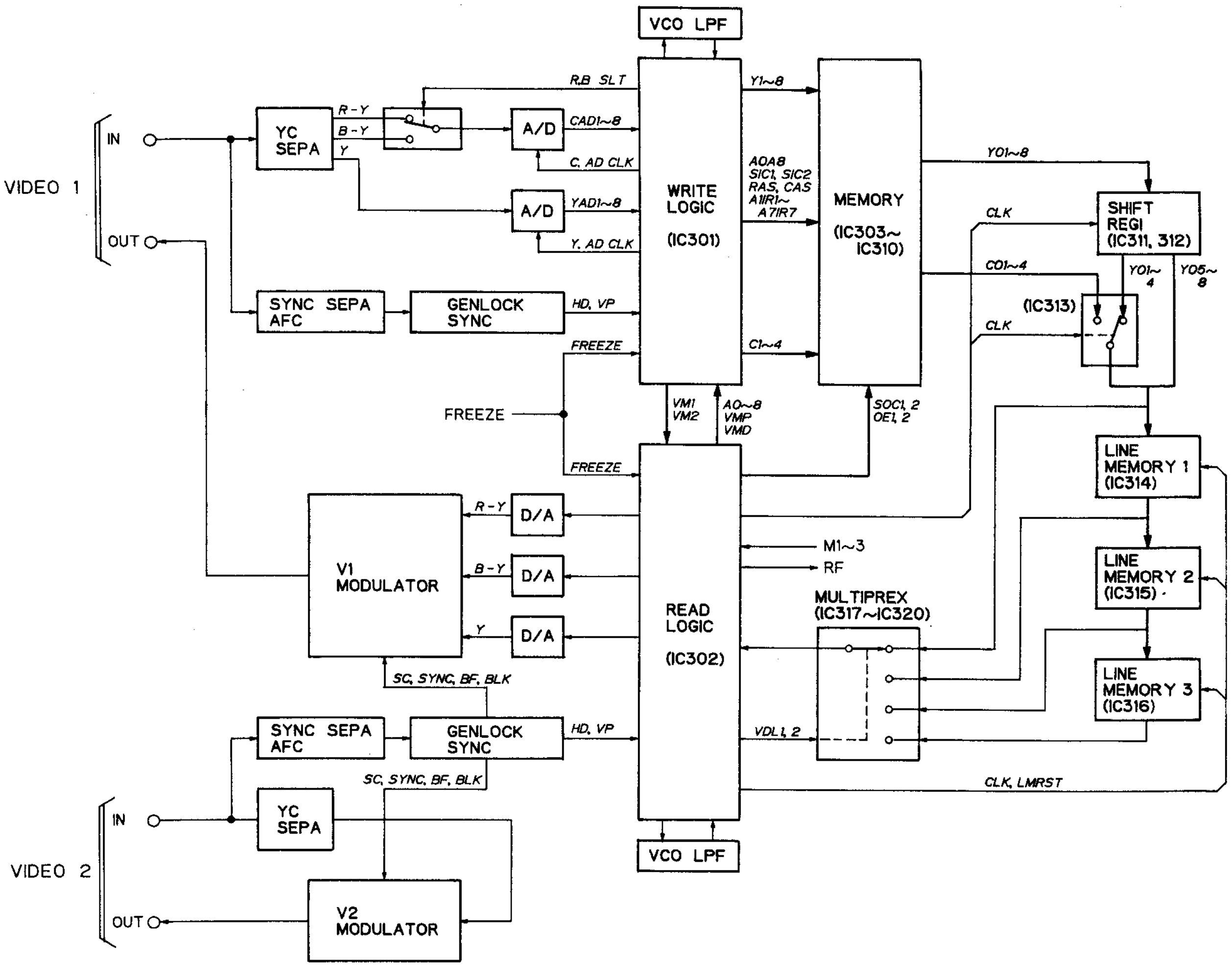

VCO LPF
R.B SLT
Y1~8
R-Y
B-Y
Y
YC SEPA
A/D
CAD1~8
C. AD CLK
A/D
YAD1~8
Y. AD CLK
WRITE LOGIC (IC301)
A0A8
SIC1, SIC2
RAS, CAS
A1IR1~
A7IR7
MEMORY (IC303~IC310)
YO1~8
CLK
SHIFT REGI (IC311, 312)
CO1~4
YO1~4
YO5~8
(IC313)
CLK
VIDEO 1
IN
OUT
SYNC SEPA AFC
GENLOCK SYNC
HD, VP
FREEZE
C1~4
FREEZE
VM1
VM2
A0~8
VMP
VMD
SOC1, 2
OE1, 2
LINE MEMORY 1 (IC314)
FREEZE
R-Y
D/A
V1 MODULATOR
B-Y
D/A
Y
D/A
M1~3
RF
MULTIPREX (IC317~IC320)
READ LOGIC (IC302)
LINE MEMORY 2 (IC315)
LINE MEMORY 3 (IC316)
SC, SYNC, BF, BLK
SYNC SEPA AFC
GENLOCK SYNC
HD, VP
VDL1, 2
SC, SYNC, BF, BLK
CLK, LMRST
VIDEO 2
IN
OUT
YC SEPA
VCO LPF
V2 MODULATOR

Fig. 1-3 Frame Synchromizer

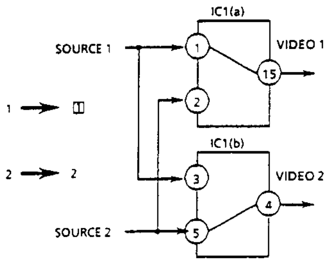
2-1 V1 (VIDEO 1) Demodulator circuit

This circuit is consisting of IC1 ~ IC6, IC8, IC9, Q1 ~ Q11, Q14 ~ Q19 and Q22 ~ Q29 and generates Y, R-Y & B-Y signals from the VIDEO 1 signal and HD1 and VP1 signals from the composite sync signal of the VIDEO 1 signal.

The SOURCE 1 video signal from the rear panel is fed to pin 1 of IC1 (a) and pin 3 of IC1 (b) in the V2 Demodulator circuit.

The SOURCE 2 video signal is fed to pin 5 of IC1 (b) and pin 2 of IC1 (a) as well.

The IC1 (a) and IC1 (b) are controlled by the Input Mode Selection Switches as shown below.


IC1(a)
SOURCE 1
1
VIDEO 1
15
2
1
IC1(b)
2
2
3
VIDEO 2
4
SOURCE 2
5

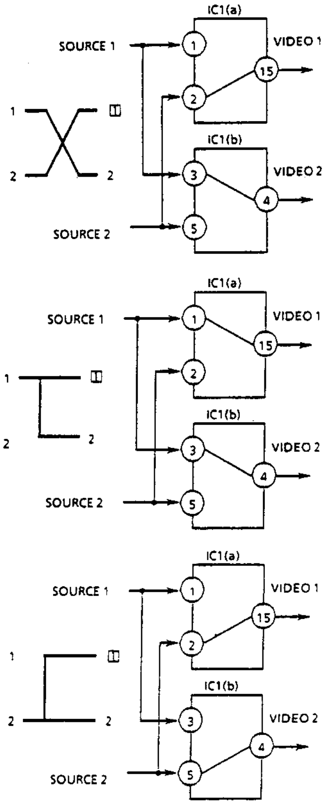

IC1(a)
SOURCE 1
1
VIDEO 1
15
1
2
IC1(b)
2
2
3
VIDEO 2
4
SOURCE 2
5
IC1(a)
SOURCE 1
1
VIDEO 1
15
1
2
IC1(b)
2
2
3
VIDEO 2
4
SOURCE 2
5
IC1(a)
SOURCE 1
1
VIDEO 1
15
1
2
IC1(b)
2
2
3
VIDEO 2
4
SOURCE 2
5

Fig. 1-4 Input Mode Selection

The VIDEO 1 signal selected by the input selection switches is then sent to the Y, R-Y & B-Y and sync separation circuit as shown below.

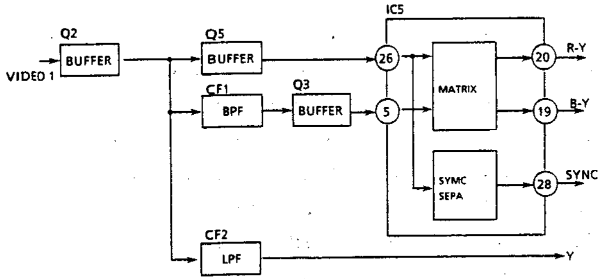

IC5
Q2
VIDEO 1
BUFFER
Q5
BUFFER
CF1
BPF
Q3
BUFFER
26
5
MATRIX
20
R-Y
19
B-Y
SYMC SEPA
28
SYNC
CF2
LPF
Y

Fig. 1-5 Y,C,Sync Separation

The demodulated R-Y & B-Y signal and Y signal are fed to the low pass amplifier Q6 ~ Q11 and CF3 for R-Y signal, Q14 ~ Q19 and CF4 for B-Y signal and Q22 ~ Q27 and CF5 for Y signal.

The separated V1 sync signal obtained at pin 26 of IC5 is fed to the AFC, GEN-LOCK circuit as shown below.

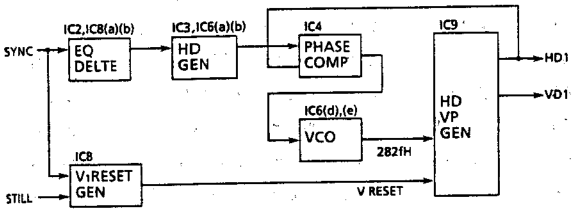

IC2,IC8(a)(b)
IC3,IC6(a)(b)
IC4
IC9
SYNC
EQ DELTE
HD GEN
PHASE COMP
HD1
VD1
IC6(d),(e)
VCO
HD VP GEN
282fH
IC8
ViRESET GEN
STILL
V RESET

Fig. 1-6 AFC,Gen-Lock Circuit

In case the STILL mode is selected, the V.reset pulse generator stops generating the V.reset pulse and HD1 and Vp1 pulses are stopped in order to stop writing the memories.

2-2 V1 A/D Converter circuit

This circuit is consisting of IC7, IC11 ~ IC13, IC301, Q12, Q13, Q20 and Q21 and convert the analog Y and C (R-Y, B-Y) signals into 8 bit digital signal.

The R-Y & B-Y signals are selected alternately by 2.4MHz (156fH) pulse fed to pins 9, 10, 11 of IC11 so that the R-Y and B-Y signals are chopped into 128 bits per line.

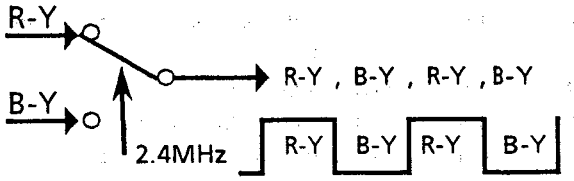

R-Y
B-Y
R-Y , B-Y , R-Y , B-Y
2.4MHz
R-Y
B-Y
R-Y
B-Y

Fig. 1-7 R-Y/B-Y to C Conversion

The R-Y & B-Y signal is then fed to pin 28 of A/D converter IC12 and converted into 8 bits digital signal (CAD1 ~ CAD8) fed to pins 23 ~ 30 of Memory Write Control gate array IC301.

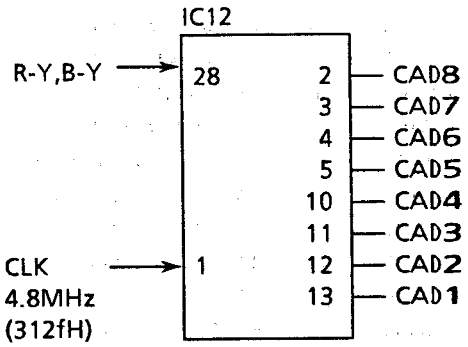

IC12
R-Y,B-Y
28
CLK
4.8MHz
(312fH)
1
2
3
4
5
10
11
12
13
CAD8
CAD7
CAD6
CAD5
CAD4
CAD3
CAD2
CAD1

Fig. 1-8 Chroma A/D Conversion

The Y signal is also fed to the other A/D converter IC13 in order to convert Y signal into 8 bit digital signal and 512 bits per line.

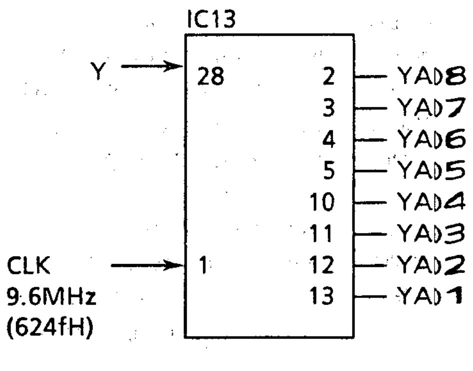

IC13
Y
28
CLK
9.6MHz
(624fH)
1
2
3
4
5
10
11
12
13
YAD8
YAD7
YAD6
YAD5
YAD4
YAD3
YAD2
YAD1

Fig. 1-9 Luminance A/D Conversion

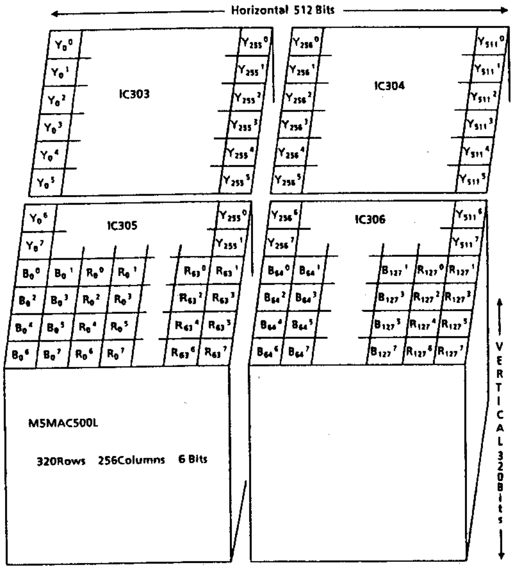
Pin identification of IC301 is as follows.

Pin No.	Symbol	In/Out	Description
1	OSCO	Out	VCO 19.5MHz (1248fH)
2	WRTF	Out	Write Field (Odd:L, Even: H)
3	P2M	Out	Positive 2MHz (fvco/8) Out
4	N2M	Out	Negative 2MHz (fvco/8)
5	P4M	Out	Positive 4MHz (fvco/4)
6	OES	In	Odd, Even Select (L:Odd, H:Even) (4MHz)
7	N4M	Out	Negative 4MHz (fvco/4)
8	P9M	Out	Positive 9MHz (fvco/2)
9	LACK	In	Data Latch Clock (9MHz)
10	V_{DD2}	In	Power Supply
11	CLR	In	Clear (L:Clear, H:Normal)
12	V_{SS2}	In	Ground
13	TECK	In	Test Clock (L:Normal)
14	N9M	Out	Negative 9MHz (fvco/2)
15	YAD1	In	Y signal A/D Input (LSB)
16	YAD2	In	Y signal A/D Input
17	YAD3	In	Y signal A/D Input
18	YAD4	In	Y signal A/D Input
19	YAD5	In	Y signal A/D Input
20	YAD6	In	Y signal A/D Input
21	YAD7	In	Y signal A/D Input
22	YAD8	In	Y signal A/D Input (MSB)
23	CAD1	In	R-Y, B-Y A/D Input (LSB)
24	CAD2	In	R-Y, B-Y A/D Input
25	CAD3	In	R-Y, B-Y A/D Input
26	CAD4	In	R-Y, B-Y A/D Input
27	CAD5	In	R-Y, B-Y A/D Input
28	CAD6	In	R-Y, B-Y A/D Input
29	CAD7	In	R-Y, B-Y A/D Input
30	CAD8	In	R-Y, B-Y A/D Input (MSB)
31	V_{SS1}	In	Ground
32	NP	In	NTSC/PAL Select (H:NTSC, L:PAL)
33	V_{DD2}	In	Power Supply
34	WWHDI	In	Write Wide HD In
35	WHDO	In	Write HD Out
36	WVPI	In	Write Vertical Pulse In
37	STILL	In	Still Input (L:Still, H:Live)
38	STILLO	Out	Still Output
39	RHDI	In	Read HD In (Trigger of Read mode)
40	VM1O	Out	Vertical Mode 1 Out
41	VM2O	Out	Vertical Mode 2 Out
42	VMP	In	Vertical MOSAIC Pattern In (L:RAM→SIM, H:HOLD)
43	A8	In	Read Vertical Address In (MSB)
44	A7	In	Read Vertical Address In
45	A6	In	Read Vertical Address In
46	A5	In	Read Vertical Address In
47	A4	In	Read Vertical Address In
48	A3	In	Read Vertical Address In
49	A2	In	Read Vertical Address In
50	A1	In	Read Vertical Address In
51	A0	In	Read Vertical Address In (LSB)
52	V_{SS2}	In	Ground
53	SIC1	Out	Serial Clock 1
54	V_{DD2}	In	Power Supply
55	SIC2	Out	Serial Clock 2
56	RAS	Out	Read Address Select
57	CAS	Out	Cell Address Select
58	A0A8	Out	Memory Mode, Read Address
59	A1IR1	Out	Memory Mode, Read Address
60	A2IR2FN	Out	Memory Mode, Read Address
61	A2IR2FP	Out	Memory Mode, Read Address
62	A3IR3	Out	Memory Mode, Read Address
63	A4IR4	Out	Memory Mode, Read Address
64	A5IR5	Out	Memory Mode, Read Address
65	A6IR6	Out	Memory Mode, Read Address
66	A7IR7	Out	Memory Mode, Read Address
67	C4	Out	Chroma data 4 (CAD7 & CAD8)
68	C3	Out	Chroma data 3 (CAD5 & CAD6)
69	C2	Out	Chroma data 2 (CAD3 & CAD4)
70	C1	Out	Chroma data 1 (CAD1 & CAD2)
71	Y8	Out	Y data 8 (MSB)
72	Y7	Out	Y data 7
73	V_{DD1}	In	Power Supply
74	TEHCK	In	Test Horizontal Clock (L: Normal)
75	V_{SS2}	In	Ground
76	Y6	Out	Y data 6
77	Y5	Out	Y data 5
78	Y4	Out	Y data 4
79	Y3	Out	Y data 3
80	Y2	Out	Y data 2
81	Y1	Out	Y data 1 (LSB)
82	PCAO	Out	Phase comparator A out
83	PCBO	Out	Phase comparator B out
84	OSCI	In	VCO 19.5MHz (1248fH)

In this way, Y, R-Y & B-Y (C) data is sent to the 8 memories.

2-3 Memory Circuit

This circuit is consisting of 8 memories IC303 ~ IC310, 3 line memories IC314 ~ IC316, 2 shift regiters IC311, IC312, 4 multiplexers IC317 ~ IC320 and 1 selector IC313.
The capacity of IC303 ~ IC310 memories is 6 (Graduation) x 256 (Horizontal) x 320 (Scanning line) (Max) = 491520 bits/chip.
The assignment of 8 memories is as follows.



Assignment of DRAM for 1 Field

Odd Field	IC303 (Y1~Y6) IC305 (Y7,Y8,C1~C4)	IC304 (Y1~Y6) IC306 (Y7,Y8,C1~C4)
	Left picture	Right picture

Even Field	IC307 (Y1~Y6) IC309 (Y7,Y8,C1~C4)	IC308 (Y1~Y6) IC310 (Y7,Y8,C1~C4)
	Left picture	Right picture

Fig. 10

The 3 line memories (3x1H digital data delay) are used to adjust (compensate) the time difference between the VIDEO 1 and VIDEO 2 (nonsynchronous) signals.
IC317 ~ IC320 select the suitable one out of 4 (0H, 1H, 2H, 3H delayed) signals to prevent the mixing of old picture and new picture.

2-4 V1 D/A Converter Circuit

This circuit is consisting of IC29 ~ IC31, IC302, Q65 ~ Q68, Q71 ~ Q74, Q77 ~ Q81 and convert the 8 bit digital signals of Y, R - Y, B - Y signals into analog signals.
Pin identification of IC302 is as follows.

Pin No.	Symbol	In/Out	Description
84	OSCI	In	VCO 19.5MHz (1248fH)
1	OSCO	Out	VCO 19.5MHz (1248fH)
2	READ F	Out	Read Field (L:odd, H:Even)
3	M1	In	Mode 1 (MOSAIC 1 or PAINT 1)
4	M2	In	Mode 2 (MOSAIC 2 or PAINT 2)
5	M3	In	Mode 3 (MOSAIC 3 or PAINT 3)
6	YDA8	Out	Y data 8 (MSB)
7	YDA7	Out	Y data 7
8	YDA6	Out	Y data 6
9	YDA5	Out	Y data 5
10	V_{DD2}	In	Power Supply
11	TEVCK	In	Test Clock (L:Normal)
12	V_{SS2}	In	Ground
13	YDA4	Out	Y data 4
14	YDA3	Out	Y data 3
15	YDA2	Out	Y data 2
16	YDA1	Out	Y data 1 (LSB)
17	RDA8	Out	R-Y data 8 (MSB)
18	RDA7	Out	R-Y data 7
19	RDA6	Out	R-Y data 6
20	RDA5	Out	R-Y data 5
21	V_{DD2}	In	Power Supply
22	V_{SS2}	In	Ground
23	RDA4	Out	R-Y data 4
24	RDA3	Out	R-Y data 3
25	RDA2	Out	R-Y data 2
26	RDA1	Out	R-Y data 1 (LSB)
27	BDA8	Out	B-Y data 8 (MSB)
28	BDA7	Out	B-Y data 7
29	BDA6	Out	B-Y data 6
30	TECK	In	Test clock (L:Normal)
31	V_{SS1}	In	Ground
32	CLR	In	Clear (L:Clear, H:Normal)
33	V_{DD2}	In	Power Supply
34	BDA5	Out	B-Y data 5
35	BDA4	Out	B-Y data 4
36	BDA3	Out	B-Y data 3
37	BDA2	Out	B-Y data 2
38	BDA1	Out	B-Y data 1 (LSB)
39	D8	In	Y, Chroma data 8
40	D7	In	Y, Chroma data 7

41	D6	In	Y, Chroma data 6
42	D5	In	Y, Chroma data 5
43	D4	In	Y, Chroma data 4
44	D3	In	Y, Chroma data 3
45	D2	In	Y, Chroma data 2
46	D1	In	Y, Chroma data 1
47	VDL2	Out	Vertical Delay Select 2
48	VDL1	Out	Vertical Delay Select 1
49	LMRST	Out	Line Memory Reset
50	S219M	Out	19MHz Clock
51	P19M	Out	19MHz Clock
52	V_{SS2}	In	Ground
53	NP	In	NTSC/PAL Select (H:NTSC, L:PAL)
54	V_{DD2}	In	Power Supply
55	N9M	Out	Negative 9MHz (fvco/2)
56	P9M	Out	Positive 9MHz (fvco/2)
57	OE2FN	Out	Output Enable, Even Field, Right Pix
58	OE2FP	Out	Output Enable, Odd Field, Left Pix
59	OE1FN	Out	Output Enable, Even Field, Right Pix
60	OE1FP	Out	Output Enable, Odd Field, Left Pix
61	SOC2	Out	Serial Output Clock, Right Pix
62	SOC1	Out	Serial Output Clock, Left Pix
63	A0	Out	Read Vertical Address
64	A1	Out	Read Vertical Address
65	A2	Out	Read Vertical Address
66	A3	Out	Read Vertical Address
67	A4	Out	Read Vertical Address
68	A5	Out	Read Vertical Address
69	A6	Out	Read Vertical Address
70	A7	Out	Read Vertical Address
71	A8	Out	Read Vertical Address
72	VMPO	Out	Vertical Mosaic Pattern
73	V_{DD1}	In	Power Supply
74	TEHCK	In	Test Clock (L:Normal)
75	V_{SS2}	In	Ground
76	VM2I	In	Vertical Delay Mode 2
77	VM1I	In	Vertical Delay Mode 1
78	RHDO	Out	Read HD Out
79	STILL	In	Still (L:Still, H:Live)
80	RVPI	In	Read Vertical Pulse
81	RWHDI	In	Read Wide HD
82	PCAO	Out	Phase Comparator A Out
83	PCBO	Out	Phase Comparator B Out

The Y and C data fed at pis 39 ~ 46 of IC302 is converted into 8 bit Y signal obtained at pins 6 ~ 16, 8 bit R-Y signal at pins 17 ~ 26 and 8 bit B-Y signal at pins 27 ~ 38 and are sent to D/A converter Z1 (R-Y), Z2 (B-Y) and Z3 (Y) through buffer IC29 ~ IC31 respectively.

2-5 V1 Modulator Circuit

This circuit is consisting of IC25 and Q52 ~ Q54 and generate a composite video signal for VIDEO 1 which sync timing is same as that of VIDEO 2 signal.

2-6 V2 Demodulator Circuit

This circuit generates Y, R-Y, B-Y signal from the VIDEO 2 signal (not SOURCE 2 signal) and HD, Vp pulse for read out same manner as V1 Demodulator circuit.
IC17 (c) detects whether the VIDEO 2 signal is supplied or not and its output is fed to pin 10 of IC20 through IC19 (b). When no VIDEO 2 signal is supplied, crystal oscillator X3 and L15 (VCO INT) oscillates as internal mode.

2-7 Sync Warning Detection Circuit

This circuit is consisting of IC17 (c), IC19 (b), IC22, IC23 (a), IC19 (c), IC24 and IC32 and detect the sync condition as follows.

Internal Sync :	No sync signal is supplied neither IC17 (c) nor IC22.
Gen-lock Sync : (Normal)	Sync signal is supplied to IC17 (c) and sync disturbance is less than 1/2 Vertical period at pin 1 of IC22.
Gen-lock Sync : (Disturbed)	Sync signal is supplied to IC17 (c) and sync disturbance (lack) is more than 1/2V period at pin 1 of IC22.

3. Mixer Board

This board contains following circuits.

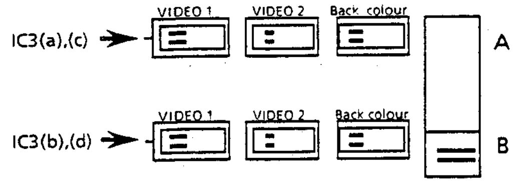
- Wipe/Mix/Fader circuit
- Superimpose circuit
- Audio Amplifier circuit

3-1 Wipe/Mix/Fader circuit

This circuit is consisting of IC2 ~ IC6, IC9, IC10, Q1 ~ Q7, Q18 ~ Q38, Q43 and Q44 and generates wipe, mix (lap-dissolve) and fade-in/out effects.

The VIDEO 1 signal is fed to pin 7 of IC3 through buffer/clamper Q1 & Q3 and the VIDEO 2 signal is fed to pin 13 of IC3 through buffer/clamper Q18 & Q20.

IC3 (a) and IC3 (c) are A-bus input selection circuit and IC3 (b) and IC3 (d) are B-bus input selection circuit.


IC3(a),(c)
VIDEO 1
VIDEO 2
Back colour
A
IC3(b),(d)
VIDEO 1
VIDEO 2
Back colour
B

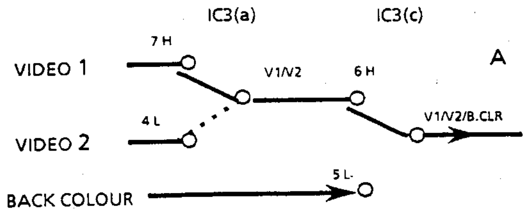

IC3(a)
IC3(c)
VIDEO 1
7 H
V1/V2
6 H
A
4 L
V1/V2/B.CLR
VIDEO 2
5 L
BACK COLOUR

Fig. 1-11 Wipe/Mix Source Selection

The selected A-bus video signal obtained at pin 3 of IC3 and B-bus video signal obtained at pin 17 of IC3 are fed to the wipe generator IC4 (a) and (b) through buffers Q44 and Q43 respectively.

The wipe effect generation is made as following 3-modes.

(1) Wipe/Mix Lever (VR3) is in the upper end. (Upper (A))

(2) Wipe/Mix Lever is in the middle position. (Middle (Wipe A/B))

(3) Wipe/Mix Lever is in the lower end. (Lower (B))

(1) Upper (A)

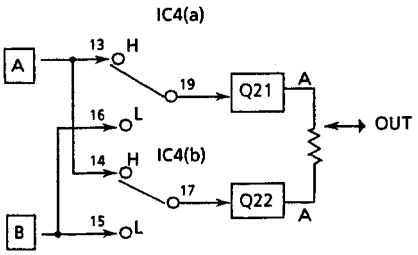

IC4(a)
A
13 H
19
Q21
A
16 L
OUT
14 H
IC4(b)
17
Q22
B
15 L
A

Fig. 1-12

(2) Middle (Wipe, A/B)

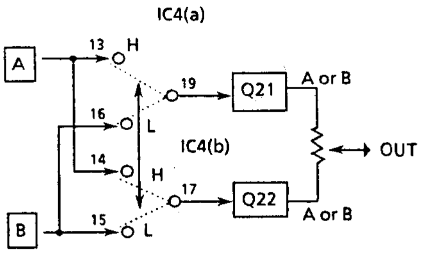

IC4(a)
A
13 H
19
Q21
A or B
16 L
IC4(b)
OUT
14 H
17
Q22
A or B
B
15 L

Fig. 1-13

IC4 (a) and (b) select the A or B signal simultaneously according to the selected wipe pattern.

(3) Lower (B)

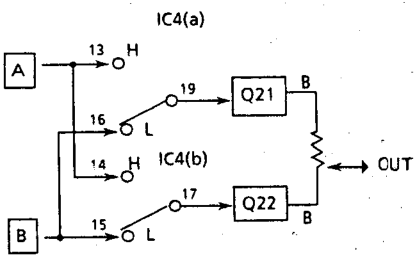

IC4(a)
A
13 H
19
Q21
B
16 L
14 H
IC4(b)
OUT
17
Q22
B
15 L

Fig. 1-14

When the mix mode is selected, IC4 (a) and (b) are set as follows.

Mix Mode

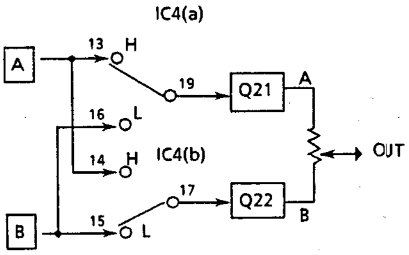

IC4(a)
A
13 H
19
Q21
A
16 L
14 H
IC4(b)
OUT
17
Q22
B
15 L

Fig. 1-15

The wiped/mixed video signal obtained at the base of Q23 is fed to the fade-in/out control IC4 (c) and (d) through Q23 and Q25.

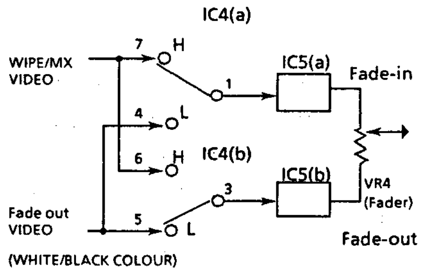

IC4(a)
WIPE/MX VIDEO
7 H
1
IC5(a)
Fade-in
4 L
6 H
IC4(b)
IC5(b)
3
VR4 (Fader)
Fade out VIDEO
5 L
Fade-out
(WHITE/BLACK COLOUR)

Fig. 1-16

The superimposed title character signal is mixed by IC5 (a) and (b).

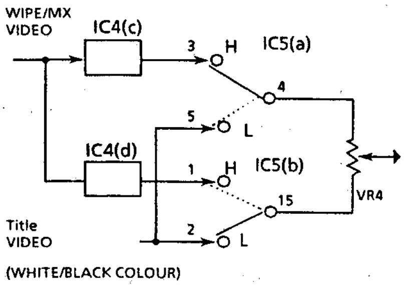

WIPE/MX VIDEO
IC4(c)
3
H
IC5(a)
4
5
L
IC4(d)
1
H
IC5(b)
15
VR4
Title VIDEO
2
L
(WHITE/BLACK COLOUR)

Fig. 1-17

The title mixed video signal obtained at the emitter of Q28 is sent to the PREVIEW OUT connector on the rear panel and the REC VIDEO OUT selector IC9 (c).

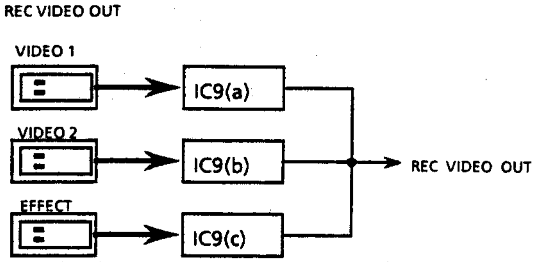
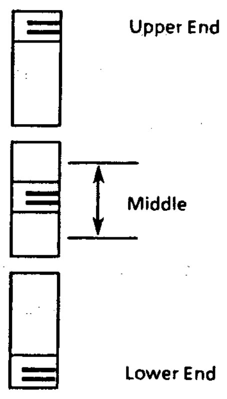

REC VIDEO OUT
VIDEO 1
IC9(a)
VIDEO 2
IC9(b)
REC VIDEO OUT
EFFECT
IC9(c)

Fig. 1-18

IC12 (a) and (b) are the position detector for the WIPE/MIX Lever as follows.


Upper End
Middle
Lower End

Pin 1	Pin 2
H	L
L	L
L	H

Fig. 1-19

IC10 (a) and (b) are the position detector for the FADE control L and (b) are the position detector for the FADE control lever same manner as for the one for WIPE/MIX lever.

IC11 (a) and (b) are used to select the fade out color from the one of WHITE, BLACK and BACK COLOR.

IC11 (c) select the color of the title character either WHITE or BACK COLOR.

IC5 (c) is used to generate the title character video signal.

3-2 Superimpose Circuit

This circuit select the one out of the VIDEO 1 & 2 and the video signal (title video signal) from the external camera connected to the EXT CAMERA input connector on the rear panel and the title character signal from the character generator WV-KB12 (A) connected to the TITLE connector on the front panel and generates the superimpose signal with the edge or shadow enhancement.

IC6 (a) and (b) are used to select the source of superimpose signal out of the VIDEO 1, VIDEO 2 and EXT CAMERA.

IC7 (a) and (b) are A/D converter for superimpose signal and their threshold levels for upper and lower are adjusted by VR1 and VR2 independently.

IC25 (a) is used to invert the superimpose signal by the Reverse switch.

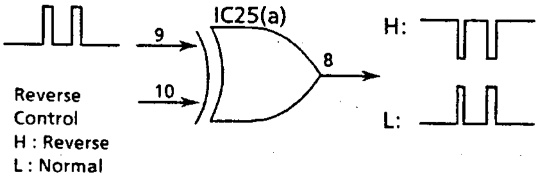

IC25(a)
9
10
8
Reverse Control
H : Reverse
L : Normal
H:
L:

Fig. 1-20

IC23 and IC24 are used to generate the edge or shadow signal of the title edge as follows.

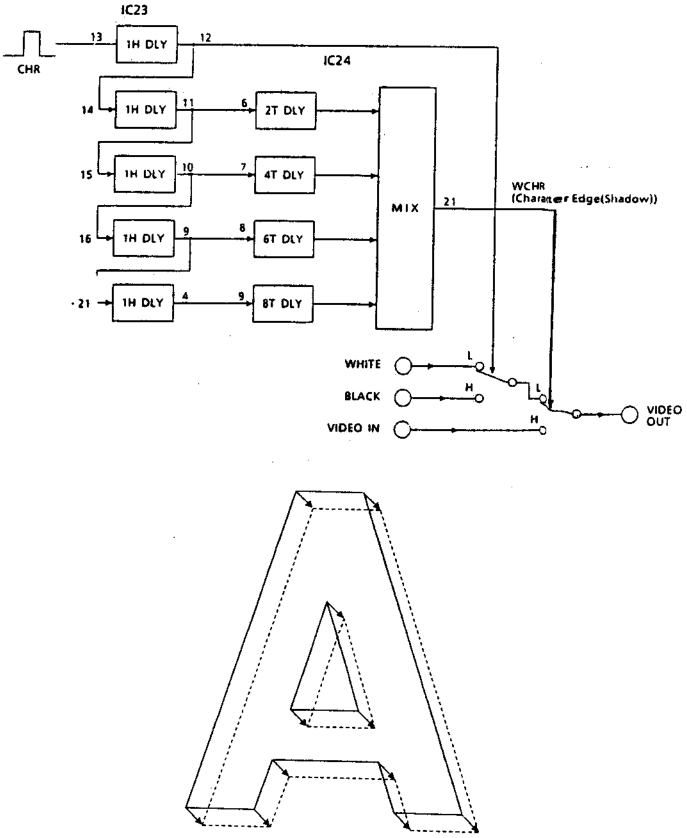

IC23
CHR
13
1H DLY
12
IC24
14
1H DLY
11
6
2T DLY
15
1H DLY
10
7
4T DLY
16
1H DLY
9
8
6T DLY
21
1H DLY
4
9
8T DLY
MIX
21
WCHR
(Character Edge(Shadow))
WHITE
BLACK
VIDEO IN
L
H
L
H
VIDEO OUT

Fig. 1-21

VR12 and VR13 are used to set the horizontal and vertical masking pulse width in order not to display the titles as follows.

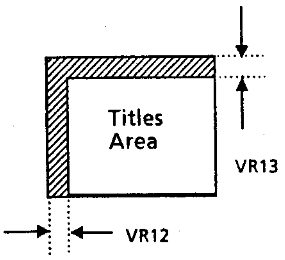

Titles Area
VR13
VR12

Fig. 1-22

3-3 Audio Amplifier Circuit

The audio amplifier circuit mixes the SOURCE 1 (Left/Right), SOURCE 2 (L/R), AUX (L/R) and MIC (mono) signals and obtains the REC AUDIO OUT (L/R) on the rear panel and the HEADPHONE OUT on the front panel.
IC14 is the amplifier for microphone and it amplifies the mic signal approx. 40dB.
IC22 has 2 amplifiers (Left and Right) and their amplitude is controlled by the DC voltage fed to pin 8 as an electronic volume control.
The gain balance of these amplifier is set by VR8.

4. Control Board

This board contains following circuits.

- Back Color Generator circuit
- Wipe Waveform Generator circuit
- System Control circuit

4-1 Back Color Generator Circuit

The back color selection switch SW1 select the back color as follows.

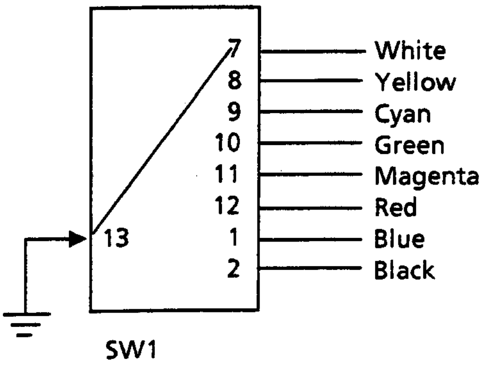

7 White
8 Yellow
9 Cyan
10 Green
11 Magenta
12 Red
13
1 Blue
2 Black
SW1

Fig. 1-23

IC2 is on 8-to-3 Line Priority Encoder and used to convert 8 colors to the 3 primary colors (R.G.B).
IC30 is used to make selection of back color during vertical blanking period.
IC1 is an encoder and receives R, G and B signals at pins 13, 14 and 15 and generates non composite back color video signal obtained at pin 1.

4-2 Wipe Waveform Generator Circuit

The horizontal wipe waveforms are generated by IC14 ~ IC17, IC23 (b) and IC28.

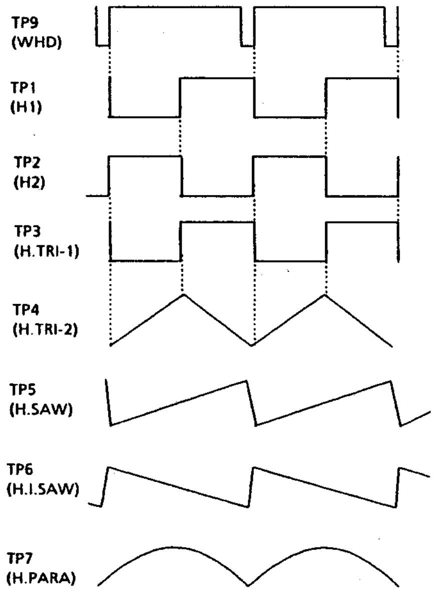

TP9 (WHD)
TP1 (H1)
TP2 (H2)
TP3 (H.TRI-1)
TP4 (H.TRI-2)
TP5 (H.SAW)
TP6 (H.I.SAW)
TP7 (H.PARA)

Fig. 1-24

When the positive control is set to the edge of the picture, IC24 (a) (H) and IC24 (b) (V) generate the inhibit signal for wipe in order not to display the spurious fold back wipe for the circles and square wipe modes.

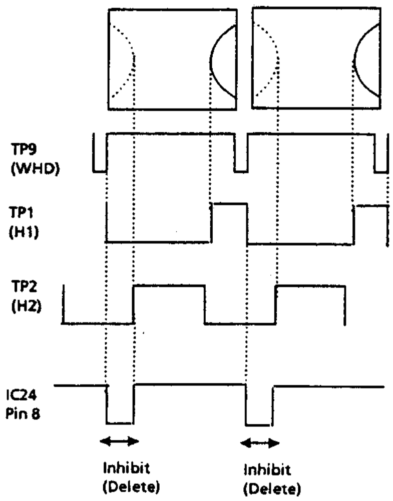

TP9 (WHD)
TP1 (H1)
TP2 (H2)
IC24 Pin 8
Inhibit (Delete)
Inhibit (Delete)

Fig. 1-25

4-3 System Control Circuit

IC11 is the microprocessor for system control and pin identification is as follows.

Pin No.	Symbol	In/Out	Description
1	Vss	—	Ground
2	P00	Out	Positioner Control (H:OFF, L:ON)
3	P01	Out	V.triangle select (H:ON, L:OFF)
4	P02	Out	V.sawtooth select (H:ON, L:OFF)
5	P03	Out	V.Inverted sawtooth (H:ON, L:OFF)
6	PC2	Out	Freeze control (H:Freeze, L:Normal)
7	P10	Out	H.Triangle select (H:ON, L:OFF)
8	P11	Out	H.Sawtooth select (H:ON, L:OFF)
9	P12	Out	H.Inverted sawtooth (H:ON, L:OFF)
10	P13	Out	H & V parabola (H:ON, L:OFF)
11	SYNC	Out	Not used
12	SIRQ	In	Not used
13	IRQ	In	Vp (V.sync) input
14	SBT	In/Out	Serial clock input and output
15	SBO	Out	ACK data
16	SBI	In	Serial data input
17	RST	In	Reset input
18	P20	Out	A-bus select-1
19	P21	Out	A-bus select-2
20	P22	Out	B-bus select-1
21	P23	Out	B-bus select-2
22	P30	Out	Wipe or Mix select (H:Wipe, L:Mix)
23	P31	Out	Wipe all off (H:All off, L:Normal)
24	P32	Out	Titler (WV-KB12) masking pulse
25	P33	Out	Superimpose Reverse (H:Reverse, L:Normal)
26	P40	Out	Fade control-1 (Title F.IN)
27	P41	Out	Fade control-1 (Title F.OUT)
28	P42	Out	Fade control-2 (Video F.IN)
29	P43	Out	Fade control-3 (Video F.OUT)
30	P50	Out	Audio Fade control (H:ON, L:OFF)
31	P51	Out	Title edge control-1 (T.NORM)
32	P52	Out	Title edge control-1 (T.BORD)
33	V_{DD}	In	Power Supply
34	PCO	Out	Paint control (H:Normal, L:Paint)
35	PCI	Out	Mosaic control (H:Normal, L:Mosaic)
36	P53	Out	Title edge control-2 (T.EDGE)
37	P60	In	B-bus ON/OFF (H:ON, L:OFF)
38	P61	In	A-bus ON/OFF (H:ON, L:OFF)
39	P62	In	Fade-in ON/OFF (H:ON, L:OFF)
40	P63	In	Fade-out ON/OFF (H:ON, L:OFF)
41	P70	In	Not used
42	P71	In	Not used
43	P72	In	Not used
44	P73	In	Strobe timing pulse input
45	P80	Out	REC OUT select-V1 (H:V1)
46	P81	Out	REC OUT select-V2 (H:V2)
47	P82	Out	REC OUT select-EFF (H:Effect)
48	P83	In	NTSC or PAL (H:NTSC, L:PAL)
49	P90	Out	Fade color-1
50	P91	Out	Fade color-2
51	P92	Out	Serial clock out
52	P93	Out	Title color (H:Color, L:White)
53	PA0	Out	Wipe control-A bus
54	PA1	Out	Wipe control-B bus
55	PA2	Out	Superimpose select-1
56	PA3	Out	Superimpose select-2
57	PB0	Out	Still-L (H:Normal or strobe, L:Freeze)
58	PB1	Out	Serial start pulse (Vp)
59	PB2	Out	Input Mode select-1
60	PB3	Out	Input Mode select-2
61	OSC2		Clock oscillator
62	OSC1		Clock oscillator
63	XI	In	Wide HD (H sync)
64	X0	Out	Not used

5. Switch Board

This board contains the microprocessor for key-matrix input and their LED control.

Pin identification of IC1 is as follows.

Pin No.	Symbol	In/Out	Description
1	Vss		Ground
2	SYNC		Not used
3	P60/IRQ	In	Serial start pulse (Vp)
4	P61/SBI	In	ACK data input
5	P62/SBO*	Out	Serial data output
6	P63/SBT	Out	Serial clock output
7	P00	In	Key scan in-0
8	P01	In	Key scan in-1
9	P02	In	Key scan in-2
10	P03	In	Key scan in-3
11	P10	In	Key scan in-4
12	P11	In	Key scan in-5
13	P12	In	Key scan in-6
14	P13	In	Key scan in-7

15	P20	Out	Key & LED out-0
16	P21	Out	Key & LED out-1
17	P22	Out	Key & LED out-2
18	P23	Out	Key & LED out-3
19	P30	Out	Key & LED out-4
20	P31	Out	Not used
21	P32	Out	Not used
22	P33	Out	Not used
23	P40	Out	LED out-0
24	P41	Out	LED out-1
25	P42	Out	LED out-2
26	P43	Out	LED out-3
27	P50	Out	LED out-4
28	P51	Out	LED out-5
29	P52	Out	LED out-6
30	P53	Out	LED out-7

31	PC0	In	NTSC or PAL (H:NTSC, L:PAL)
32	PC1		Not used
33	PC2		Not used
34	PC3		Not used
35	PE0		Not used
36	PE1		Not used
37	OSC1		Clock oscillator
38	OSC2		Clock oscillator
39	XI	In	Wide HD (H sync)
40	X0		Not used
41	RST	In	Reset input
42	V_{DD}	In	Power Supply

The key scan matrix chart is as follows.

KEY SCAN MATRIX

Key board µ-Com. (MN15542)

IN / OUT	P20	P21	P22	P23	P30
P00	FAON (AUDIO FADE ON/OFF)	WPAV 1 (WIPE/MIX CHA VIDEO 1)	WIPE 1 (WIPE PATTERN 1)	SIV 1 (SUPERIMPOSE SOURCE VIDEO 1)	INFORM (INPUT MODE NORMAL)
P01	FCC (COLOR FADE)	WPAV 2 (WIPE/MIX CHA VIDEO 2)	WIPE 2 (WIPE PATTERN 2)	SIV 2 (SUPERIMPOSE SOURCE VIDEO 2)	INREV (INPUT MODE REVERSE)
P02	FCW (WHITE FADE)	WPABC (WIPE/MIX CHA BACK COLOR)	WIPE 3 (WIPE PATTERN 3)	SION (SUPERIMPOSE ON/OFF)	INBOT 1 (INPUT MODE MASTER 1)
P03	FCB (BLACK FADE)	WPBV 1 (WIPE/MIX CHB VIDEO 1)	WIPE 4 (WIPE PATTERN 4)	SIREV (SUPERIMPOSE REVERSE)	INBOT 2 (INPUT MODE MASTER 2)
P10	OUTV 1 (OUTPUT SELECT VIDEO 1)	WPBV 2 (WIPE/MIX CHB VIDEO 2)	WIPE 5 (WIPE PATTERN 5)	SICC (SUPERIMPOSE BACK COLOR)	FSON (FRAME SYNCRO ON/OFF)
P11	OUTV 2 (OUTPUT SELECT VIDEO 2)	WPBBC (WIPE/MIX CHB BACK COLOR)	WIPE 6 (WIPE PATTERN 6)	SICW (SUPERIMPOSE WHITE)	FREZ (FREEZE ON/OFF)
P12	OUTEF (OUTPUT SELECT EFFECT)	FVON (VIDEO FADE ON/OFF)	WIPEON (WIPE ON/OFF)	TEFF (TITLE EFFECT SELECT)	STRB (STROBE ON/OFF)
P13	EXTCAM (SUPERIMPOSE EXT. CAMERA)	FTON (TITLE FADE ON/OFF)	MIXON (MIXING ON/OFF)	PAINT (PAINT ON/OFF)	MOSAIC (MOSAIC ON/OFF)

ADJUSTMENT PROCEDURE

1. Test Equipment Required

- Oscilloscope (Dual trace, Delayed sweep, 50MHz bandwidth)
- Digital voltmeter
- Frequency counter (More than 7 digits)
- Underscanned color video monitor
- Test signal generator (Color bar and Cross hatch signals)
- Waveform monitor
- Vectorscope
- Audio generator

2. Disassembling Procedure for adjustment

- Remove eleven screws holding the bottom cover and open the top cover.

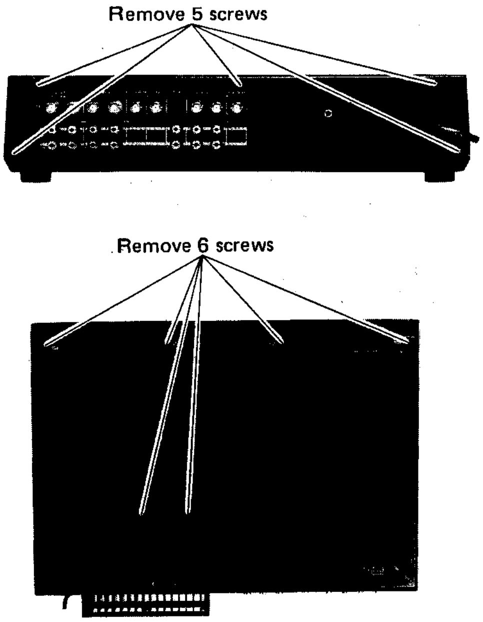


Fig. 2-1

3. Connection

- Connect the coaxial cable between the REC VIDEO OUT 1 connector on the rear panel of WJ-MX10 and the VIDEO IN connector of the waveform monitor.
- Connect the coaxial cable between the other VIDEO IN connector of the waveform monitor and the VIDEO IN connector of the vectorscope.
- Terminate the other VIDEO IN connector of the vectorscope with the 75-ohm terminator.
- Connect the coaxial cable between the VIDEO OUT connector of the waveform monitor and the VIDEO IN connector of the color video monitor.

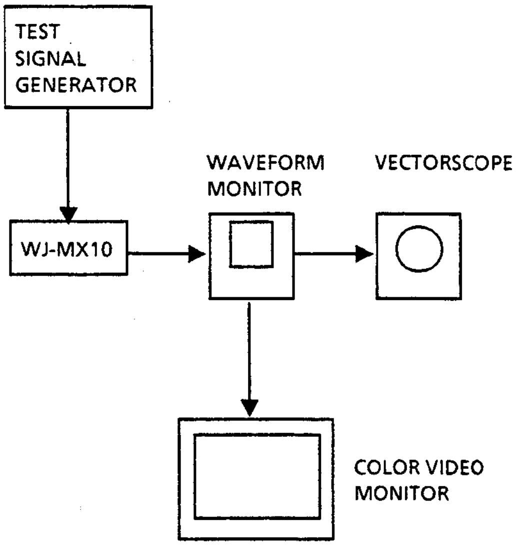


Fig. 3-1

- Terminate the other VIDEO IN connector of the color video monitor with 75 ohms.

4. Adjustment Procedure

- Refer to LOCATION OF TEST POINTS AND ADJUSTING CONTROLS on page for adjustment.

(1) Automatic Frequency Control (AFC) adjustment

Test points :	*TP6 (V1 HD)*	*Sync board*
	TP16 (V2 HD)	*Sync board*
Adjusts :	*VR6 (AFC1)*	*Sync board*
	VR12 (AFC2)	*Sync board*

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.
- Connect the frequency counter to TP6 on the Sync board.
- Adjust VR6 for 16.667kHz ± 50Hz.
- Connect the frequency counter to TP16 on the Sync board.
- Adjust VR12 for 16.667kHz ± 50Hz.

(2) Internal Voltage Controlled Oscillator (VCO INT) adjustment

Test point :	*TP31 (VCO)*	*Sync board*
Adjust :	*L15 (VCO)*	*Sync board*

- Keep disconnecting the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.
- Connect the digital voltmeter to TP31 on the Sync board.
- Adjust L15 for 2.1V ± 0.1V.

(3) Internal Subcarrier Frequency (fsc INT, fvcxo1, fvcxo2) adjustment

Test points :	*TP19 (SC1)*	*Sync board*
	TP2 (V1 SC)	*Sync board*
	TP12 (V2 SC)	*Sync board*
Adjusts :	*CT3 (fsc INT)*	*Sync board*
	CT1 (fvcxo1)	*Sync board*
	CT2 (fvcxo2)	*Sync board*

- Keep disconnecting the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.
- Connect the frequency counter to TP19 on the Sync board.
- Adjust CT3 for 4.433619MHz ± 5Hz.
- Connect the frequency counter to TP2 on the Sync board.
- Adjust CT1 for 4.433619MHz ± 10Hz.
- Connect the frequency counter to TP12 on the Sync board.
- Adjust CT2 for 4.433619MHz ± 10Hz.

(4) Gen-lock Voltage Controlled Oscillator (VCO 1, VCO 2) adjustment

Test points :	*TP7 (V1 VCO)*	*Sync board*
	TP17 (V2 VCO)	*Sync board*
Adjusts :	*L1 (VCO1)*	*Sync board*
	L6 (VCO2)	*Sync board*

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Connect the coaxial cable between the VIDEO OUT connector of the SOURCE 1 (VIDEO) connectors on the rear panel of the WJ-MX10 and the SOURCE 2 IN (VIDEO) connector on the rear panel of the WJ-MX10 for looping-through connection.
- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the digital voltmeter to TP7 on the Sync board.
- Adjust L1 for 2.1V ± 0.1V.
- Connect the digital voltmeter to TP17 on the Sync board.
- Adjust L6 for 2.1V ± 0.1V.

(5) Read & Write Voltage Controlled Oscillator (VCO R, VCO W) adjustment

Test points :	*TP301 (W VCO)*	*Sync board*
	TP302 (R VCO)	*Sync board*
Adjusts :	*L303 (VCO W)*	*Sync board*
	L309 (VCO R)	*Sync board*

- Keep suppling the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the digital voltmeter to TP301 on the Sync board.
- Adjust L303 for 2.1V ± 0.1V.
- Connect the digital voltmeter to TP302 on the Sync board.
- Adjust L309 for 2.1V ± 0.1V.

(6) Burst Gate Width adjustment

Test points :	*TP1 (SOURCE 1)*	*Sync board*
	TP28 (V1 CHROMA)	*Sync board*
	TP11 (SOURCE 2)	*Sync board*
	TP29 (V2 CHROMA)	*Sync board*
Adjusts :	*VR1 (BURST GATE 1)*	*Sync board*
	VR7 (BURST GATE 2)	*Sync board*

- Keep suppling the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the oscilloscope to TP1 and TP28 on the Sync board.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the oscilloscope to H rate and expand the horizontal blanking period.
- Adjust VR1 so that the burst blanking (masking) width becomes 0.5µs ± 0.1µs.

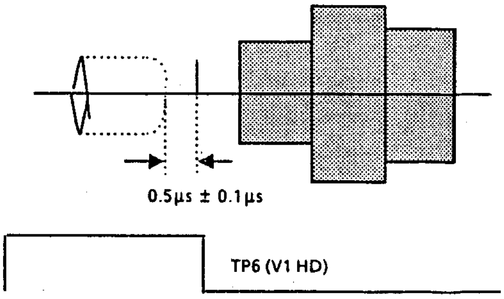


Fig. 4-1

CAUTION : If the TP28 has no chroma signal, set VR2 (CHROMA GAIN 1) to the mechanical center temporally in order to obtain the chroma signal.

- Connect the oscilloscope to TP11 and TP29 on the Sync board.
- Connect the external trigger input of oscilloscope to TP16 (V2 HD) and set the oscilloscope to H rate and expand the horizontal blanking period.
- Adjust VR7 so that the burst blanking (masking) width becomes 0.5µs ± 0.1µs.

(7) Sync Level adjustment

Test point :	*REC VIDEO OUT connector*	*Rear panel*
Adjusts :	*VR16 (V1 SYNC)*	*Sync board*
	VR22 (V2 SYNC)	*Sync board*

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.

- Observe the waveform monitor or connect the oscilloscope to either the REC VIDEO OUT 1 connector or the REC VIDEO OUT 2 connector on the rear panel of WJ-MX10 which is terminated with 75 ohms.
- Press the VIDEO 1 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Connect the external trigger input of oscilloscope to TP21 (HD2) and set the oscilloscope to H rate and expand the horizontal blanking period.
- Adjust VR16 so that the sync level becomes 0.3Vp-p ± 0.02Vp-p.

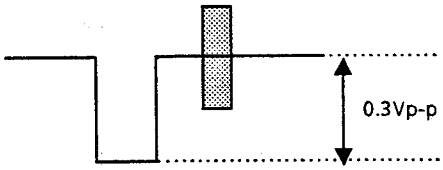


Fig. 4-2

- Press the VIDEO 2 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Adjust VR22 so that the sync level becomes 0.3Vp-p ± 0.02Vp-p.

(8) Carrier Balance and Burst adjustment

Test point :	*REC VIDEO OUT connector*	*Rear panel*
Adjust :	*VR13 (V1 B-Y CAR. BAL)*	*Sync board*
	VR14 (V1 R-Y CAR. BAL)	*Sync board*
	VR17 (V1 R-Y BURST)	*Sync board*
	VR18 (V1 B-Y BURST)	*Sync board*
	VR20 (V2 R-Y CAR. BAL)	*Sync board*
	VR30 (V2 B-Y CAR. BAL)	*Sync board*
	VR19 (V2 B-Y BURST)	*Sync board*
	VR23 (V2 R-Y BURST)	*Sync board*
Observe :	*Vectorscope*	
	Waveform monitor	

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.
- Press the VIDEO 1 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Set the GAIN control of Vectorscope to maximum.
- Adjust VR13 and VR14 so that the vector positions on the center of the vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.

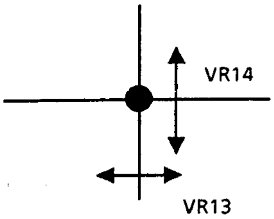


Fig. 4-3

- Set the GAIN control of Vectorscope to the CAL (Calibrated) position.
- Adjust VR17 and VR18 so that the two burst vectors are on the 75% position on the vectorscope and the phase of the two burst vectors becomes 90°.

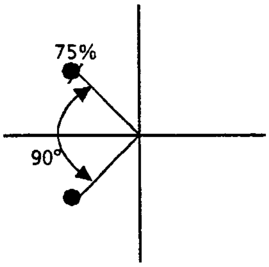


Fig. 4-4

- Repeat adjusting VR13, VR14, VR17 and VR18 so that the two burst vectors position 75% and 90° on the vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.
- Press the VIDEO 2 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Set the GAIN control of Vectorscope to maximum.
- Adjust VR20 and VR30 so that the vector positions on the center of the vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum as in case of VIDEO 1 signal.
- Set the GAIN control of Vectorscope to the CAL (Calibrated) position.
- Adjust VR19 and VR23 so that the two burst vectors are on the 75% position on the vectorscope and the phase of the two burst vectors becomes 90° as incase of VIDEO 1 signal.
- Repeat adjusting VR19, VR20, VR23 and VR30 so that the two burst vectors position 75% and 90° on the vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.

(9) Pedestal adjustment

Test point :	*REC VIDEO OUT connector*	*Rear panel*
Adjust :	*VR15 (V1 PEDESTAL)*	*Sync board*
	VR21 (V2 PEDESTAL)	*Sync board*
Observe :	*Waveform monitor*	

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Connect the coaxial cable between the VIDEO OUT connector of the SOURCE 1 (VIDEO) connectors on the rear panel of the WJ-MX10 and the SOURCE 2 IN (VIDEO) connector on the rear panel of the WJ-MX10 for looping-through connection.
- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.

- Press the VIDEO 1 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- While observing the waveform monitor, adjust VR15 so that the black bar is just touching to the blanking level.

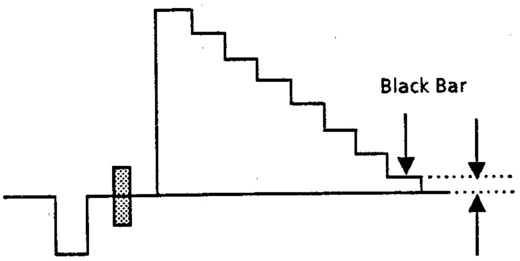


Fig. 4-5

CAUTION: Even if VR15 is turned too much, the black bar will be touched to the blanking level. It therefore should be adjusted for just touching to the blanking level.

- Press the VIDEO 2 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- While observing the waveform monitor, adjust VR21 so that the black bar is just touching to the blanking level as in case of the VIDEO 1 signal.

(10) Horizontal Phase adjustment

Test points :	*TP1 (SOURCE 1)*	*Sync board*
	TP9 (BFP 1)	*Sync board*
	TP11 (SOURCE 2)	*Sync board*
	TP20 (BFP 2)	*Sync board*
Adjust :	*VR5 (V1 H.PHASE)*	*Sync board*
	VR11 (V2 H.PHASE)	*Sync board*

- Keep the connection for step (9).
- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the oscilloscope to TP1 and TP9 on the Sync board.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the oscilloscope to H rate and expand the horizontal blanking period.
- Adjust VR5 so that the phase between the rising edge of the sync signal and that of burst flag pulse (BFP) becomes 1.9µs ± 0.05µs.

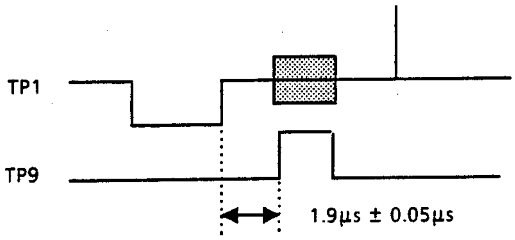


Fig. 4-6

- Connect the oscilloscope to TP11 and TP20 on the Sync board.
- Adjust VR11 so that the phase between the rising edge of the sync signal and that of burst flag pulse (BFP) becomes 1.75µs ± 0.05µs.

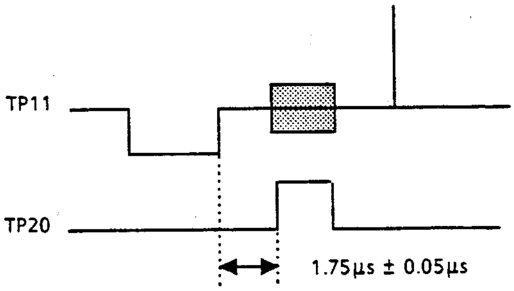


Fig. 4-7

(11) Tint adjustment

Test points :	*TP4 (B – Y A/D)*	*Sync board*
	TP14 (V2 B – Y)	*Sync board*
Adjust :	*VR3 (TINT 1)*	*Sync board*
	VR9 (TINT 2)	*Sync board*

- Keep the connection for step (10).
- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the oscilloscope to TP4 on the Sync board.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the sweep range of oscilloscope to 0.1msec ~0.2msec.
- Adjust VR3 so that the level of the two B – Y signals coincide each other.

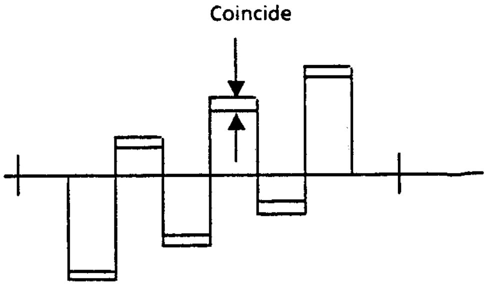


Fig. 4-8

- Connect the oscilloscope to TP14 on the Sync board.
- Adjust VR9 so that the level of the two B – Y signals coincide each other.

(12) Y signal adjustment

Test points :	*TP5 (Y A/D)*	*Sync board*
	TP27 (Y D/A)	*Sync board*
	REC VIDEO OUT Connector	*Rear panel*
Adjust :	*VR4 (Y INPUT GAIN)*	*Sync board*
	VR32 (Y BIAS)	*Sync board*
	VR26 (Y GAIN 1)	*Sync board*
	VR10 (Y GAIN 2)	*Sync board*

- Keep the connection for step (11).
- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the oscilloscope to TP5 on the Sync board.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the sweep range of oscilloscope to H. rate.
- Adjust VR4 so that the level of the Y signal becomes 1.7Vp-p ± 0.05Vp-p.

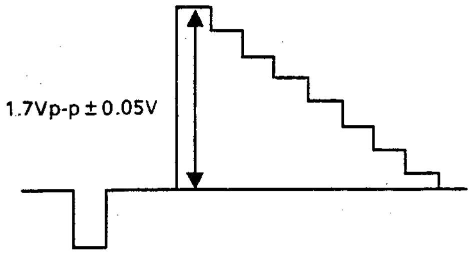


Fig. 4-9

- Connect the oscilloscope to TP27 on the Sync board.
- Adjust VR32 so that the black bar is just touching to the blanking level.

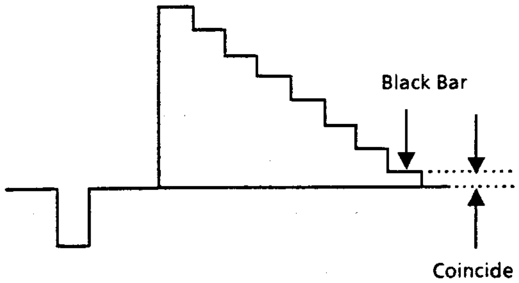


Fig. 4-10

CAUTION: Even if VR32 is turned too much, the black bar will be touched to the blanking level. It therefore should be adjusted for just touching to the blanking level.

- Press the VIDEO 1 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- While observing the waveform monitor, adjust VR26 so that the Y signal (White Bar) level becomes 0.7Vp-p ± 0.02Vp-p.
- Press the VIDEO 2 switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)

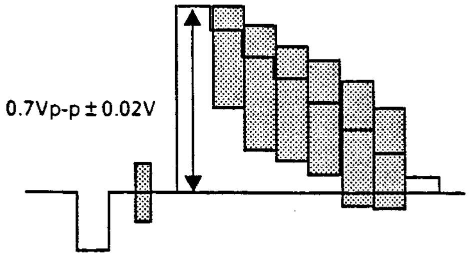


Fig. 4-11

- While observing the waveform monitor, adjust VR10 so that the Y signal (White Bar) level becomes 0.7Vp-p ± 0.02Vp-p as in case of the VIDEO 1 signal.
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Press the horizontal wipe (=) switch on the Wipe Pattern selection switches.
- Press the WIPE switch on the WIPE / MIX selection switches.
- Press the VIDEO 1 switch on the A-bus selection switches and the VIDEO 2 switch on the B-bus selection switches.
- While operating the Wipe / Mix Lever, confirm that the Y signal (White Bar) levels of VIDEO 1 and VIDEO 2 are same or within ± 5%. If not, fine-adjust VR21 (V2 PEDESTAL) and VR10 (Y GAIN 2).

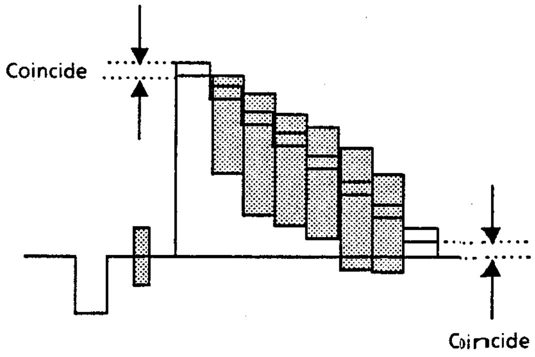


Fig. 4-12

(13) Chroma signal adjustment

Test points :	*TP3 (R − Y A/D)*	*Sync board*
	TP24 (R − Y GAIN 1)	*Sync board*
	TP24 (R − Y GAIN 1)	*Sync board*
	REC VIDEO OUT Connector	*Rear panel*
Adjust :	*VR2 (CHROMA GAIN 1)*	*Sync board*
	VR31 (CHROMA BIAS)	*Sync board*
	VR33 (R − Y BIAS)	*Sync board*
	VR24 (R − Y GAIN 1)	*Sync board*
	VR25 (B − Y GAIN 1)	*Sync board*
	VR8 (CHROMA GAIN 2)	*Sync board*
	VR34 (B − Y GAIN 2)	*Sync board*

- Keep the connection for step (12).

- Supply the composite color bar signal to the WJ-MX10 from the test signal generator.
- Connect the oscilloscope to TP3 on the Sync board.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the sweep range of oscilloscope to H. rate.
- Adjust VR2 so that the R − Y signal level becomes 1.4Vp-p ± 0.05Vp-p.

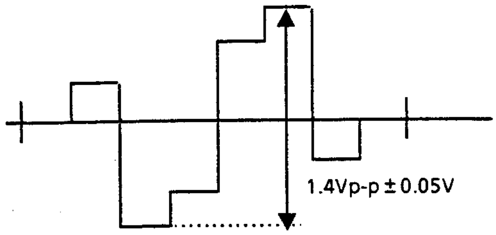


Fig. 4-13

- Press the VIDEO 1 switch on the output selection switches.
- Set the GAIN control of Vectorscope to maximum.
- Adjust VR31 and VR33 so that the vector positions on the center of the vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.

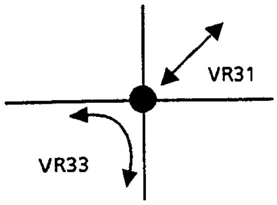


Fig. 4-14

- Set the GAIN control of Vectorscope to the CAL position and the display mode selection switch (PAL / NTSC) to NTSC mode.
- Adjust VR24 and VR25 so that the all vectors fall into their respective boxes.

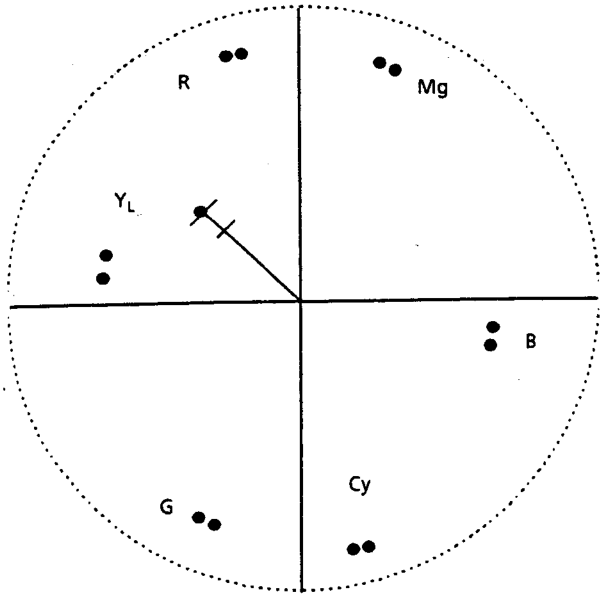


Fig. 4-15

CAUTION: If the all vectors can not be in the boxes, adjust VR24 and VR25 for following specifications while observing the center of two vectors for each color.

COLOR	SATURATION	HUE
Red	±1%	±3°
Magenta	±5%	±5°
Yellow	±1%	±3°
Blue	±5%	±5°
Green	±5%	±5°
Cyan	±5%	±5°

- Press the VIDEO 2 switch on the output selection switches.
- Adjust VR8 and VR34 so that the all vectors fall into their respective boxes.

CAUTION: If the all vectors can not be in the boxes, adjust VR8 and VR34 for following specifications while observing the center of two vectors for each color.

COLOR	SATURATION	HUE
Red	±1%	±3°
Magenta	±5%	±5°
Yellow	±2%	±3°
Blue	±5%	±5°
Green	±5%	±5°
Cyan	±5%	±5°

CAUTION: While alternately pressing the VIDEO 1 and VIDEO 2 switches on the output selection switches, confirm that the saturation difference between VIDEO 1 and VIDEO 2 siganls on the vectorscope is within 5%. If not, fine-adjust VR8 (CHRAMA GAIN 2) and VR34 (B − Y GAIN 2).

(14) Horizontal Wipe adjustment

Test points :	*TP1 (H1)*	*Control board*
	TP2 (H2)	*Control board*
	TP4 (H.TRI-2)	*Control board*
	TP5 (H.SAW)	*Control board*
	TP6 (HI SAW)	*Control board*
	TP7 (H.PARA)	*Control board*
Adjusts :	*VR1 (H.CENT-1)*	*Control board*
	VR2 (H.CENT-2)	*Control board*
	VR3 (H.TRI BAL)	*Control board*
	VR4 (H.TRi GAIN)	*Control board*
	VR5 (H.SAW GAIN)	*Control board*
	VR6 (H.SAW DC)	*Control board*
	VR7 (H.PARA GAIN)	*Control board*

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear pane
- Press the wipe pattern selection switch other than circle and square wipe.
- Connect the oscilloscope to TP1 on the Control board.
- Connect the external trigger input of oscilloscope to TP9 (HD) and set the oscilloscope to H rate.
- Adjust VR1 so that the pulse duty becomes 50% (Pulse width becomes 32µs ± 0.5µs.l.

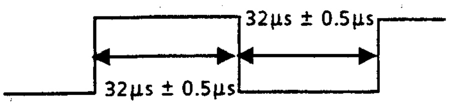


Fig. 4-16

- Connect the oscilloscope to TP2 on the Control board.
- Adjust VR2 so that the pulse duty becomes 50% (Pulse width becomes 32µs ± 0.5µs.l.

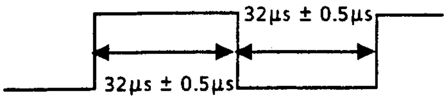


Fig. 4-17

- Connect the oscilloscope to TP4 on the Control board.
- Adjust VR3 so that the offset of the end of triangle waveform becomes 0 V ± 0.01V.

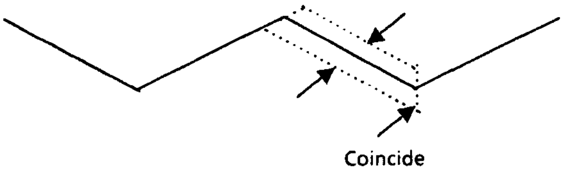


Fig. 4-18

- Adjust VR4 so that the peak level of triangle waveform becomes 4 V ± 0.05V.

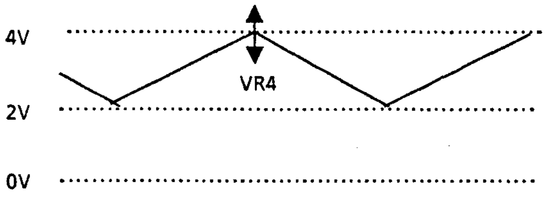


Fig. 4-19

- Connect the oscilloscope to TP5 on the Control board.
- Adjust VR5 so that the peak level of sawtooth waveform becomes 4 V ± 0.05V.

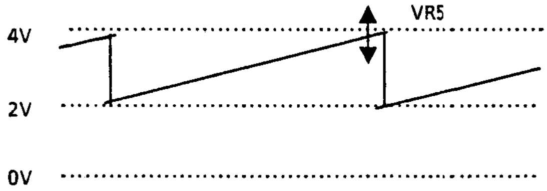


Fig. 4-20

CAUTION: This adjustment affects to the horizontal parabola waveform and the centering of the circle wipe. It therefore is recommended to confirm these adjustments.

- Connect the oscilloscope to TP6 on the Control board.
- Adjust VR6 so that the peak level of sawtooth waveform becomes 4 V ± 0.05V and confirm that the amplitude of sawtooth signal is approx.2Vp-p.

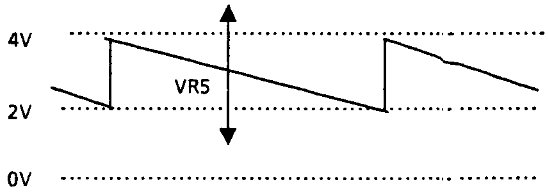


Fig. 4-21

- Connect the oscilloscope to TP7 on the Control board.
- Adjust VR7 so that the peak level of parabola waveform becomes 4 V ± 0.05V and confirm that the amplitude of sawtooth signal is approx.2Vp-p.

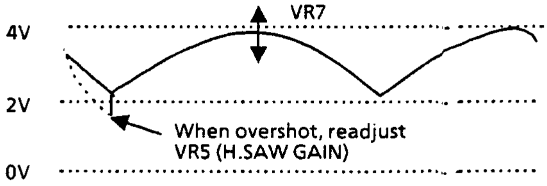


Fig. 4-22

- Confirm that the peak level of sawtooth waveform at TP5 is within 4 V ± 0.3V

(15) Vertical Wipe adjustment

Test points :	*TP11 (V1)*	*Control board*
	TP12 (V2)	*Control board*
	TP14 (V.TRI-2)	*Control board*
	TP15 (V.SAW)	*Control board*
	TP16 (VI SAW)	*Control board*
	TP17 (V.PARA)	*Control board*
Adjusts :	*VR8(V.CENT-1)*	*Control board*
	VR9 (V.CENT-2)	*Control board*
	VR10 (V.TRI BAL)	*Control board*
	VR11 (V.TRi GAIN)	*Control board*
	VR12 (V.SAW GAIN)	*Control board*
	VR13 (V.SAW DC)	*Control board*
	VR17 (V.PARA GAIN)	*Control board*

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear pane
- Press the wipe pattern selection switch other than circle and square wipe.
- Connect the oscilloscope to TP11 on the Control board.
- Connect the external trigger input of oscilloscope to TP10 (VD) and set the oscilloscope to V rate.
- Adjust VR8 so that the pulse duty becomes 50% (Pulse width becomes 10ms ± 0.1ms.l.

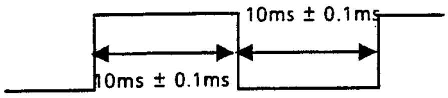


Fig. 4-23

- Connect the oscilloscope to TP12 on the Control board.
- Adjust VR9so that the pulse duty becomes 50% (Pulse width becomes 10ms ± 0.1ms.l.

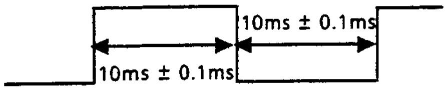


Fig. 4-24

- Connect the oscilloscope to TP14 on the Control board.
- Adjust VR10 so that the offset of the end of triangle waveform becomes 0 V ± 0.01V.

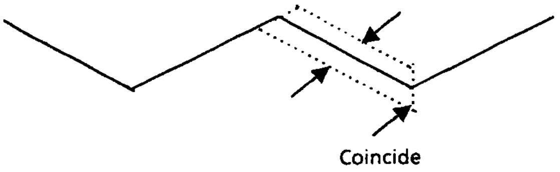


Fig. 4-25

- Adjust VR11 so that the peak level of triangle waveform becomes 4 V ± 0.05V.

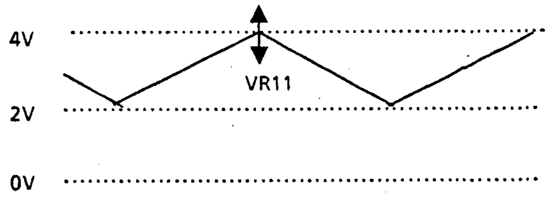


Fig. 4-25

- Connect the oscilloscope to TP15 on the Control board.
- Adjust VR12 so that the peak level of sawtooth waveform becomes 4 V ± 0.05V.

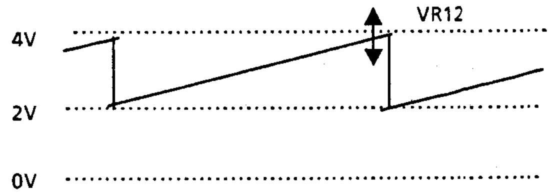


Fig. 4-26

CAUTION: This adjustment affects to the horizontal parabola waveform and the centering of the circle wipe. It therefore is recommended to confirm these adjustments.

- Connect the oscilloscope to TP16 on the Control board.
- Adjust VR13 so that the peak level of sawtooth waveform becomes 4 V ± 0.05V and confirm that the amplitude of sawtooth signal is approx.2Vp-p.

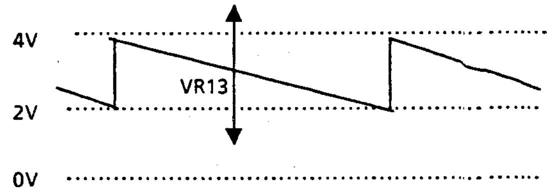
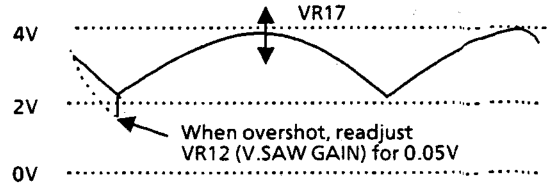


Fig. 4-27

- Connect the oscilloscope to TP17 on the Control board.
- Adjust VR17 so that the peak level of parabola waveform becomes 4 V ± 0.05V and confirm that the amplitude of sawtooth signal is approx.2Vp-p.



When overshot, readjust VR12 (V.SAW GAIN) for 0.05V

Fig. 4-28

- Confirm that the peak level of sawtooth waveform at TP15 is within 4 V ± 0.3V

(16) Symmetry adjustment

Observe :	*Color Video Monitor*	
Adjust :	*VR14 (Symmetry)*	*Control board*

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Connect the coaxial cable between the VIDEO OUT connector of the SOURCE 1 (VIDEO) connectors on the rear panel of the WJ-MX10 and the SOURCE 2 IN (VIDEO) connector on the rear panel of the WJ-MX10 for looping-through connection.
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT).
- Press the CIRCLE WIPE switch on the Wipe Pattern selection switches.
- Press the WIPE switch on the Wipe / Mix selection switches.
- Press the VIDEO 1 switch on the A-bus selection switches on the Wipe / Mix section.
- Press the BACK COLOR switch on the B-bus selection switches on the Wipe / Mix section.
- Supply the crosshutch signal to the WJ-MX10 from the test signal generator.
- Adjust WIPE / MIX lever so that the circle becomes as shown in the figure.

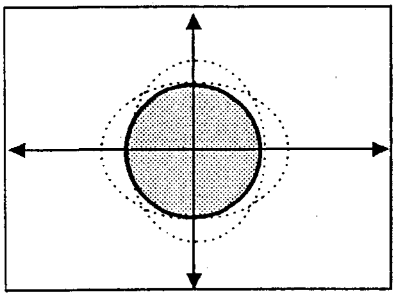


Fig. 4-30

- Adjust VR14 so that the circle becomes as true circle as possible.

(17) Centering Fine-adjustment

Observe :	*Color Video Monitor*	
Adjust :	*VR2 (H.CENT-2)*	*Control board*
	VR9 (V.CENT-2)	*Control board*
	VR11 (V.TRI GAIN)	*Control board*
	VR1 (H.CENT-1)	*Control board*
	VR8 (V.CENT-1)	*Control board*
	VR6 (H.SAW BIAS)	*Control board*
	VR13 (VSAW BIAS)	*Control board*

- Keep the connection for step (16).
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT)
- Press the SQUARE WIPE switch on the Wipe Pattern selection switches.
- Press the WIPE switch on the Wipe / Mix selection switches.
- Press the VIDEO 1 switch on the A-bus selection switches on the Wipe / Mix section.
- Press the BACK COLOR switch on the B-bus selection switches on the Wipe / Mix section.
- Supply the crosshutch signal to the WJ-MX10 from the test signal generator.
- Adjust WIPE / MIX lever so that the square becomes as shown in the figure.
- Adjust VR2 so that the horizontal variable range of positioner becomes A = B as shown in the figure.

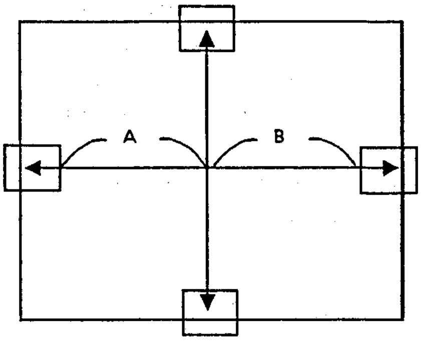


Fig. 4-31

- Adjust VR9 so that the vertical variable range of positioner becomes C = D as shown in the figure.

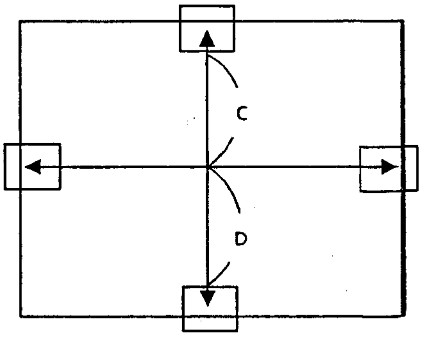


Fig. 4-32

- Set the Joystick lever of the positioner so that the square positions in the center of the screen.
- Adjust WIPE / MIX lever so that the horizontal size of the square becomes equal to 4 boxes of the crosshutch signal.
- Adjust VR11 so that the vertical size of the square becomes equal to 3 boxes of the crosshutch signal as shown in the figure.

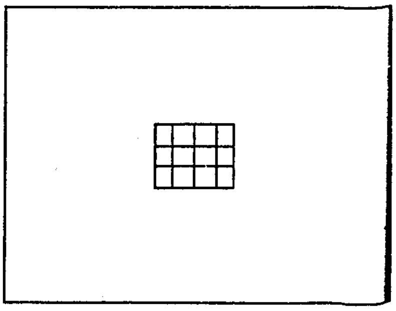


Fig. 4-33

- Press the AB BA A/B B/A switches on the Wipe Pattern selection switches for the square wipe and confirm that the positioner is disabled.
- Adjust WIPE / MIX lever so that the horizontal size of the square becomes equal to 4 boxes and the vertical size of the square becomes equal to 3 boxes of the crosshutch signal.
- Adjust VR1 so that the horizontal center of the square becomes the center (± 2%) of the crosshutch signal as shown in the figure.

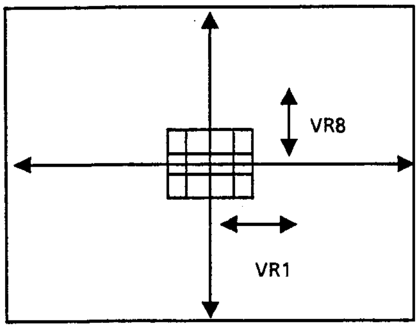


Fig. 4-34

- Adjust VR8 so that the vertical center of the square becomes the center (± 2%) of the crosshutch signal as shown in the figure
- Press the AB switch on the Wipe Pattern selection switches for the vertical wipe and confirm that the positioner is disabled.

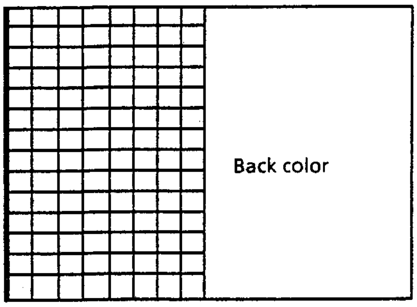


Fig. 4-35

- Adjust WIPE / MIX lever so that the wipe edge (vertical line) positions on the center of the crosshutch signal as shown in the figure
- Press the BA switch on the Wipe Pattern selection switches for the vertical wipe and confirm that the positioner is disabled.
- Adjust VR6 so that the horizontal center of the wipe edge becomes the center (± 2%) of the crosshutch signal as shown in the figure.

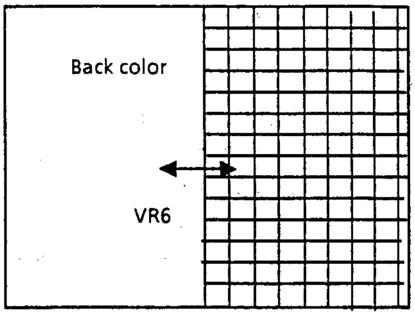


Fig. 4-36

- Press the A/B switch on the Wipe Pattern selection switches for the horizontal wipe and confirm that the positioner is disabled.

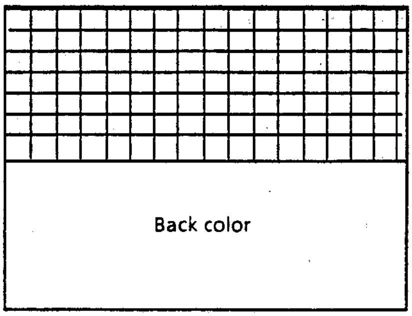


Fig. 4-37

- Adjust WIPE / MIX lever so that the wipe edge (horizontal line) positions on the center of the crosshutch signal as shown in the figure.
- Press the B/A switch on the Wipe Pattern selection switches for the horizontal wipe and confirm that the positioner is disabled.
- Adjust VR13 so that the vertical center of the wipe edge becomes the center (± 2%) of the crosshutch signal as shown in the figure.

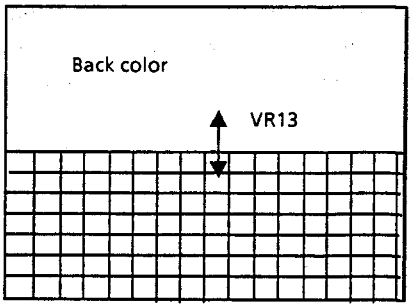


Fig. 4-38

(18) Phase Difference adjustment

Observe :	*Vectorscope*	
Adjust :	*CT4 (V1 CHROMA PHASE)*	*Sync board*
	VR17 (V1 R-Y BURST)	*Sync board*
	VR18 (V1 B-Y BURST)	*Sync board*
	VR24 (R – Y GAIN 1)	*Sync board*
	VR25 (B – Y GAIN 1)	*Sync board*

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT).
- Press the ⇉ switch on the input selection switches (⇉ / ⇉ / ⇉ / ⇉).
- Press the Horizontal wipe switch on the Wipe Pattern selection switches.
- Press the WIPE switch on the Wipe / Mix selection switches.
- Press the VIDEO 1 switches for both the A-bus and B-bus selection switches on the Wipe / Mix section.
- Adjust WIPE / MIX lever so that the wipe edge (horizontal line) positions on the center of the picture.

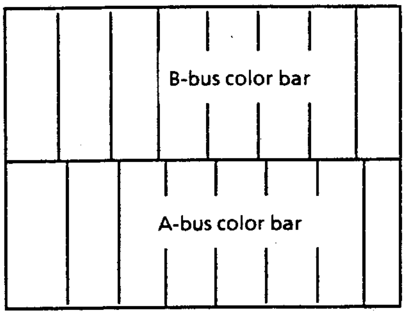


Fig. 4-39

- Adjust CT4 so that the phase of all vectors for A-bus coincide with that of B-bus or average of phase difference between A-bus and B-bus color bar vectors becomes minimum.

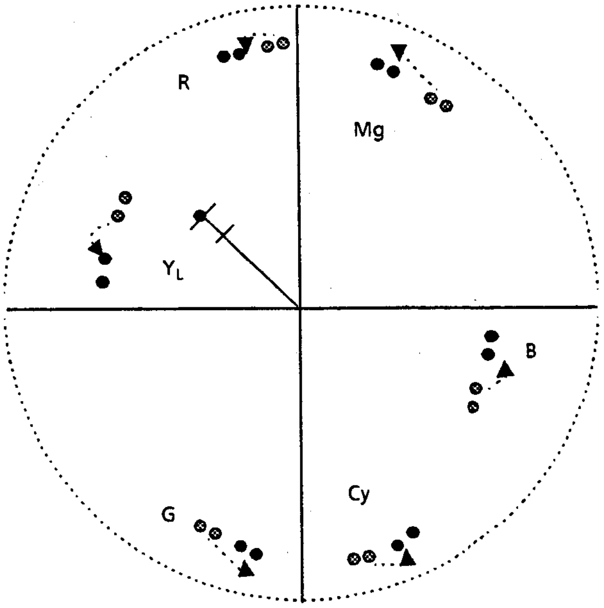


Fig. 4-40

- Set the GAIN control of Vectorscope to the CAL position and the display mode selection switch (PAL / NTSC) to PAL mode.
- Fine-adjust VR17 and VR18 so that the two burst vectors are on the 75% position on the vectorscope and the phase of the two burst vectors becomes 90°.

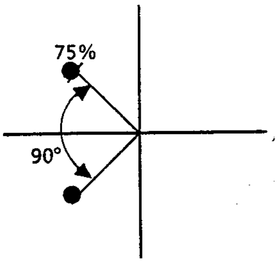


Fig. 4-41

- Set the display mode selection switch (PAL / NTSC) to NTSC mode.
- Fine-adjust VR24 and VR25 so that the all vectors fall into their respective boxes.

  CAUTION: If the all vectors can not be in the boxes, adjust VR24 and VR25 for following specifications while observing the center of two vectors for each color.

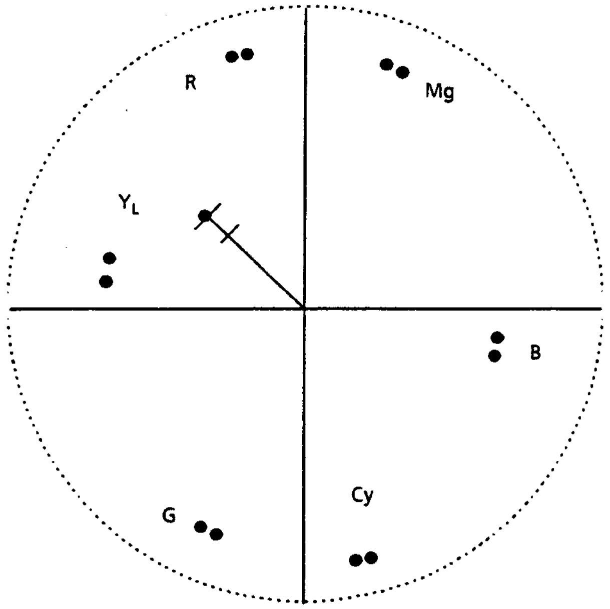


Fig. 4-42

COLOR	SATURATION	HUE
Red	±1%	±3°
Magenta	±5%	±3°
Yellow	±1%	±5°
Blue	±5%	±5°
Green	±5%	±5°
Cyan	±5%	±5°

- Adjust VR11 so that the vertical line of color bar signals coincide (within ±2%) each other on the center of the picture.

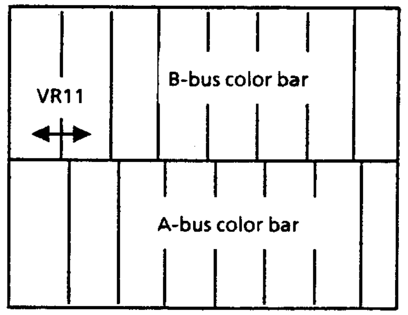


Fig. 4-43

(19) Back color Phase adjustment

Observe : *Vectorscope*
Adjust : *VR15 (BACK COLOR PHASE)* *Control board*

- Disconnect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT).
- Press the MIX switch on the Wipe / Mix selection switches.
- Press the BACK COLOR switches for both the A-bus and B-bus selection switches on the Wipe / Mix section.
- Set the WIPE / MIX lever to the A (A-bus) position all way down.
- Set the GAIN control of Vectorscope to the CAL position and the display mode selection switch (PAL / NTSC) to NTSC mode.
- Adjust VR15 so that the red vectors position one above another.

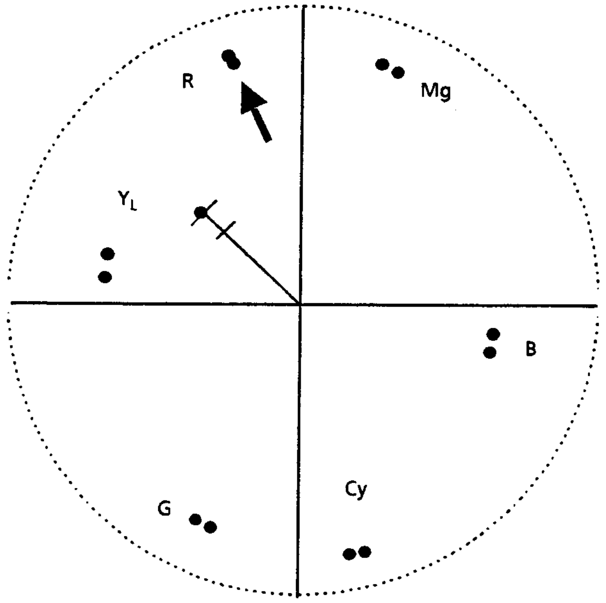


Fig. 4-44

(20) Masking adjustment

Observe : *Waveform monitor or Oscilloscope*
Adjust : *VR12 (H.MASK WIDTH)* *Mixer board*
VR13 (V.MASK WIDTH) *Mixer board*

- Disconnect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) connector on the rear panel of the WJ-MX10.
- Press the EFFECT switch on the output selection switches (VIDEO 1 / VIDEO 2 / EFFECT).
- Press the ON (Superimpose) switch on the SUPERIMPOSE selection.
- Set the KEY LEVEL controls on the SUPERIMPOSE selection to the LOW end for the LOWER control and the HIGH end for the UPPER control.
- Press the WHITE switch on the SUPERIMPOSE selection in order to set the entire picture to white.
- Observe the waveform monitor or connect the oscilloscope to the REC VIDEO OUT connector.
- Connect the external trigger input of oscilloscope to TP6 (V1 HD) and set the sweep range of oscilloscope to H. rate.

- Turn VR12 fully counterclockwise first and then turn it back slowly and stop it where the white video signal is cut (masked)1.5 µs ±0.1µs.

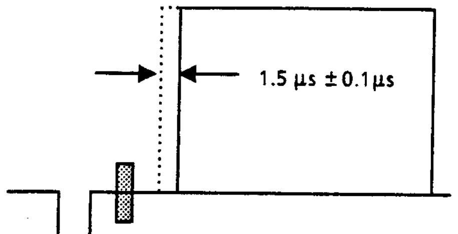


Fig. 4-45

- Observe the vertical waveform on the waveform monitor or the oscilloscope.
- Turn VR13 fully counterclockwise first and then turn it back slowly and stop it at where the white video signal is cut (masked) 6H ±1H.

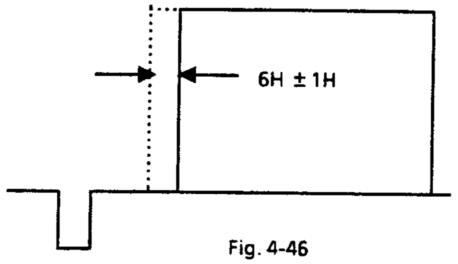


Fig. 4-46

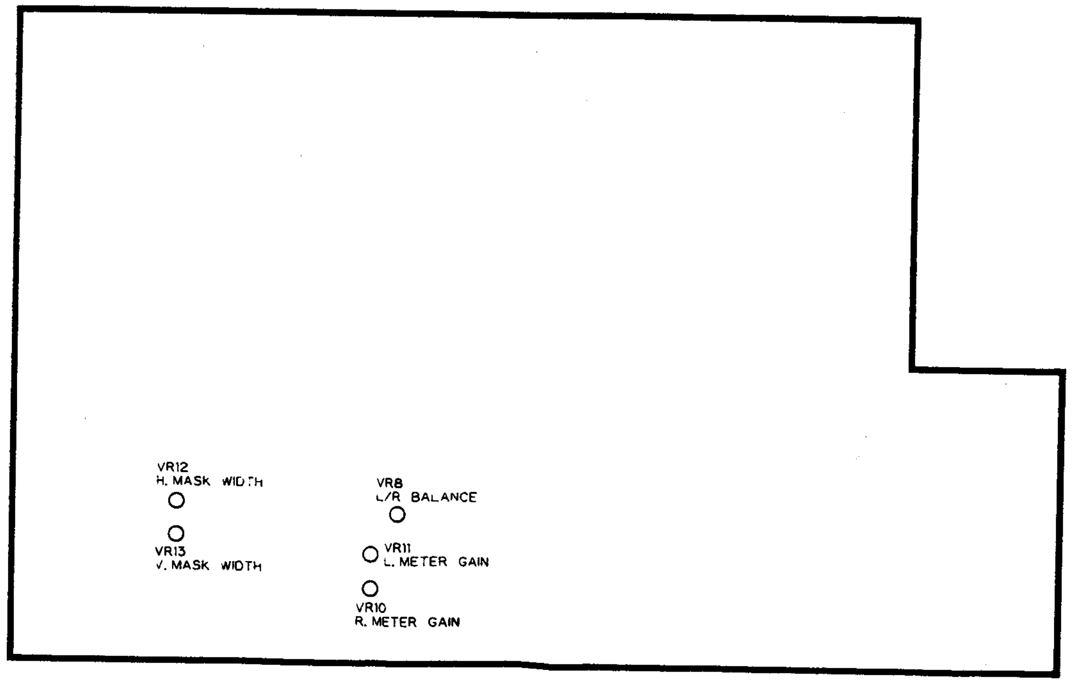
(21) Audio adjustment

Test points : *REC AUDIO OUT connectors*
Adjust : *VR8 (L/R BALANCE)* *Mixer board*
VR11 (LEFT METER PRESET) *Mixer board*
VR10 (RIGHT METER PRESET) *Mixer board*

- Connect the audio cable(s) with pin connectors (RCA connectors) between the output terminal or connector of the low frequency test signal generator and the SOURCE 1 AUDIO L and R INPUT connectors of WJ-MX10.
- Disonnect the audio cable(s) from the SOURCE 2 AUDIO L and R INPUT connectors of WJ-MX10.
- Supply the 1 kHz, −10dB (316mV rms) sinewave signal to the SOURCE 1 AUDIO L and R INPUT connectors of WJ-MX10 from the test signal generator.
- Set the AUDIO BALANCE control (AUDIO 1 / AUDIO 2) to the AUDIO 1 end.
- Set the AUDIO level control (MAX / MIN) to the MAX end.
- Connect the 2 probes of oscilloscope to the REC AUDIO OUT L and R connectors.
- Set the polarity of channel 2 of the oscilloscope to the INVERTED position and ADDED (CH1 and CH2) position in order to disply the L − R signal.
- Adjust VR8 for 0 mV ±5 mV.
- Set the AUDIO level control (MAX / MIN) so that the REC AUDIO OUT L level becomes −8dB (398mV rms).
- After confirming that the all LEDs for left channel are lit on by turning VR11 fully counterclockwise, turn VR11 clockwise slowly and stop it at where the red LED for +2 point is off and LEDs from 0 point and lower are lit on.
- After confirming that the all LEDs for right channel are lit on by turning VR10 fully counterclockwise, turn VR10 clockwise slowly and stop it at where the red LED for +2 point is off and LEDs from 0 point and lower are lit on.

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

MIXER BOARD



Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

* Letters I and O are not used

EXAMPLE:

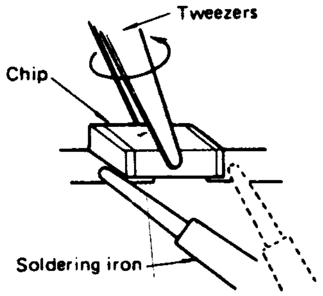
A1 ⟶ $10 \times 10^1 = 100$ pF
N2 ⟶ $33 \times 10^2 = 3300$ pF
S3 ⟶ $47 \times 10^3 = 47000$ pF

5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal.
4. Do not rub the electrode of chips.
5. Do not subject the chips to excessive stress.
6. It is recommended that a pencil-type soldering iron to be used.
7. The solder whose diameter is less than 0.5 mm is recommended.
8. Do not heat the chip beyond 3 seconds.
9. Maintain temperature control under 260°C (500°F) when soldering.

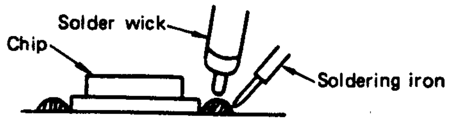
5-1 Removal (Transistor, Diode, Resistor and Capacitor)

1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning it with tweezers.
Note Be careful not to damage other chips.

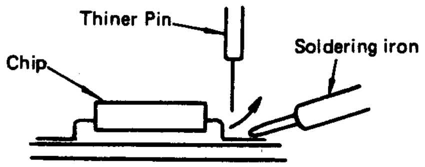

Tweezers
Chip
Soldering iron

5-2 Removal (IC)

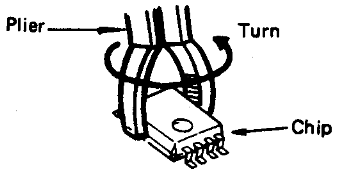
1. Add the solder wick and solder iron to each the IC and remove solder.


Solder wick
Chip
Soldering iron

2. Add the solder iron to each lead of the IC and left each lead of the IC using thiner pin.

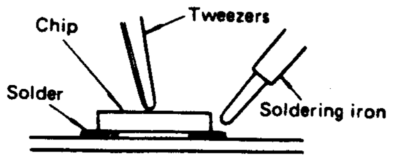

Thiner Pin
Soldering iron
Chip

3. Remove IC turning it with plier.

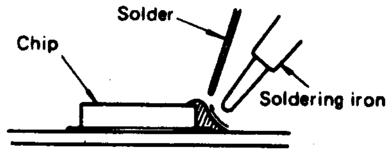

Plier
Turn
Chip

5-3 Mounting

1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarily while holding the chip with the tweezers.

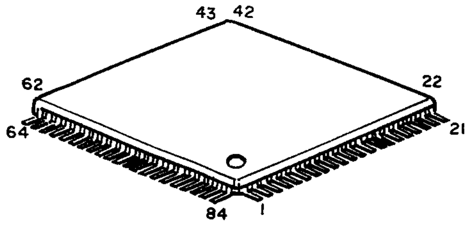

Chip
Tweezers
Solder
Soldering iron

3. Solder both ends of chip (three leads for chip transistor).

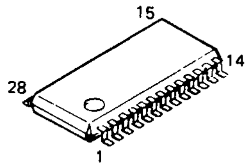

Solder
Chip
Soldering iron

APPEARANCE OF IC, TRANSISTOR AND DIODE

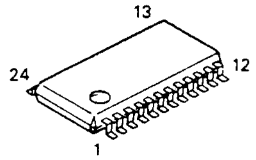
MN51010LKJ
MN51015LVK


43
42
62
22
64
21
84
1

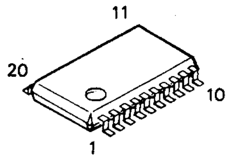
YWM51271FP
MN676021PPS



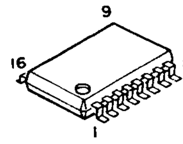
YWM51272FP
TC5081AP



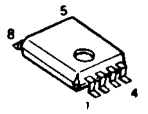
AN2510S
YWSC49069F
MN74HC245S
MN74HC273S



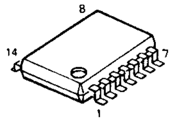
MN74HC4053S
MN4528BS
MN74HC153S
MN74HC175S
MN74HC157S
MN74HC148S
MN74HC158S



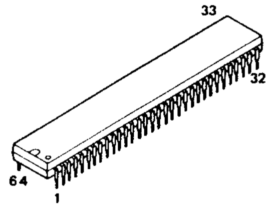
NJM3414M
AN6914S
NJM4559M
YWM5216FP
NJM4558M
BA226AF
NJM4560M



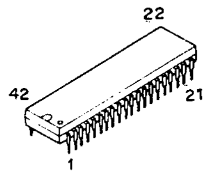
MN74HC00S
MN74HC04S
MN74HC08S
MN74HC02S
MN74HC32S
MN74HC74S
MN74HC86S
MN74HC393S
MN4013BS
MN4066BS
NJM319M



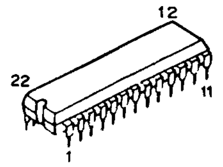
MN1554CCD1



MP7684



MP7684



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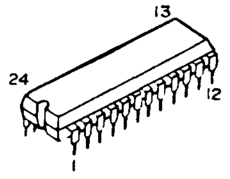
YWPD65005232



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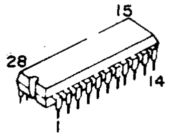
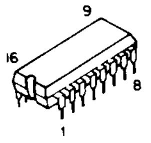


AN90B20
MN40175B



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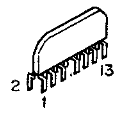

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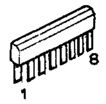
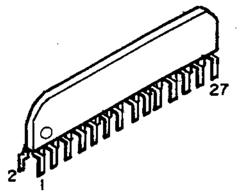
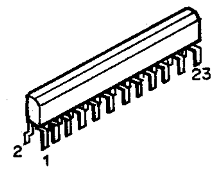


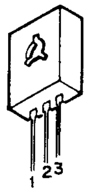
YWM5M4C500L



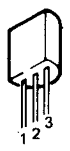
YWBA7230LS



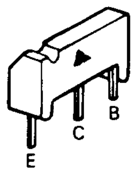
AN78N05



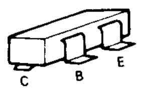
AN78L05
AN78L09
M51951ASL



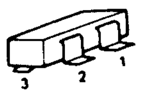
2SB641-QR
2SD636-Q



2SA1022-C
2SB709-Q
2SC2404-CDTW
2SD601-RS
2SD602-QRS

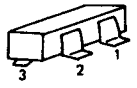


2SK198-Q



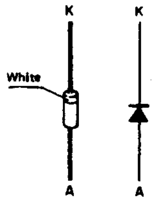
1 : Drain
2 : Source
3 : Gate

MA151K

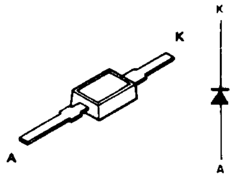


1 : NC
2 : Anode
3 : Cathode

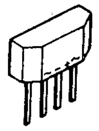
MA165



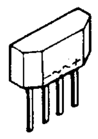
ISV153

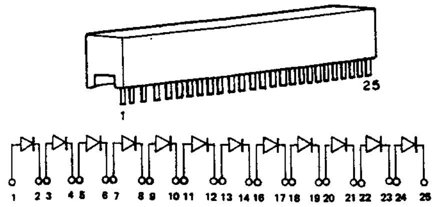


YWRB150F

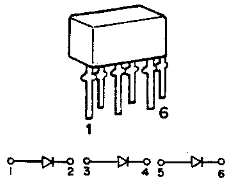


YWRBV401

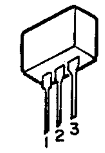



25
1
1
2 3
4 5
6 7
8 9
10 11
12 13
14 16
17 18
19 20
21 22
23 24
25

YWLT9230H

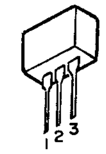


YWLT9000D
YWLT9000N



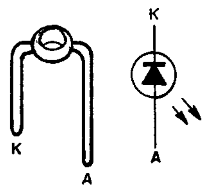
1 : Anode
2 : Cathode
3 : NC

YWLT9002ND



1 : Anode
2 : Cathode
3 : Anode

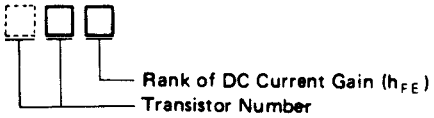
YWGL1HS211



CHIP COMPONENTS

1. Chip Transistor

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical and two alphabet letters.


Rank of DC Current Gain (h_{FE})
Transistor Number

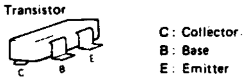
Transistor Number

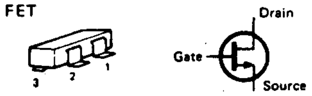
Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1Z	2SD1030
E	2SA1022	1N	2SK199
F	2SA1034	1O	2SK198
H	2SA1035	1A	2SB799
I	2SB792	1B	2SB814
K	2SC2778	1C	2SB902
P	2SD814	1F	2SK321
Q	2SD813	1L	2SK247
R	2SC2480	1K	2SK316
S	2SC2405	1M	2SJ84
T	2SC2406	1T	2SC3077
U	2SC2404	1X	2SC2845
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116

Example

WQ ⟶ 2SD602 – Q
YQ ⟶ 2SD601 – Q
1BS ⟶ 2SB814 – S

Appearance and Symbols

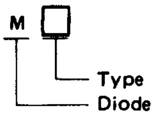

Transistor
C
B
E
C : Collector
B : Base
E : Emitter


FET
3
2
1
Drain
Gate
Source

	1	2	3
Except 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

2. Chip Diode

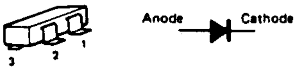
The diode number is indicated on the top surface of the chip diode using Two alphabet letters.


M
Type
Diode

Diode Number

Letter	Diode No.	Letter	Diode No.
MA	MA151A	MI	MA152K
MB	MA152A	MK	MA28W-B
MC	MA153	ML	MA28T-A
MD	MA28-A	MN	MA151WA
ME	MA28-B	MO	MA152WA
MF	MA28W-A	MT	MA151WK
MH	MA151K	MU	MA152WK

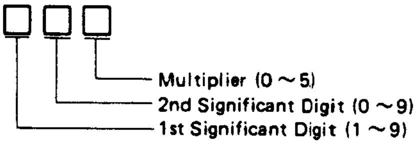
Appearance and Symbols


3
2
1
Anode
Cathode

	1	2	3
MA28/28W/28T	–	Anode	Cathode
MA151K/152K	–	Anode	Cathode
MA151A/152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.


Multiplier (0 ~ 5)
2nd Significant Digit (0 ~ 9)
1st Significant Digit (1 ~ 9)

EXAMPLE:

330 ⟶ $33 \times 10^0 = 33$ ohms
561 ⟶ $56 \times 10^1 = 560$ ohms
123 ⟶ $12 \times 10^3 = 12$ kohms

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

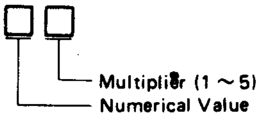
The capacitive value of replacement chip capacitors is indicated on the bottom surface. Original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

EXAMPLE:

0.5	⟶	0.5 pF	2.5	⟶	2.5 pF
75	⟶	0.75 pF	33	⟶	33 pF
1	⟶	1 pF	82	⟶	82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.


Multiplier (1 ~ 5)
Numerical Value

Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

• Letters I and O are not used

EXAMPLE:

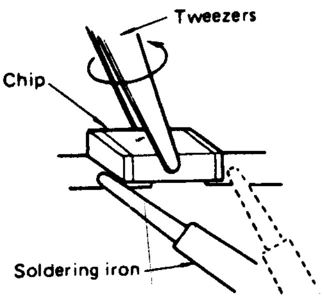
A1 ⟶ $10 \times 10^1 = 100$ pF
N2 ⟶ $33 \times 10^2 = 3300$ pF
S3 ⟶ $47 \times 10^3 = 47000$ pF

5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal.
4. Do not rub the electrode of chips.
5. Do not subject the chips to excessive stress.
6. It is recommended that a pencil-type soldering iron to be used.
7. The solder whose diameter is less than 0.5 mm is recommended.
8. Do not heat the chip beyond 3 seconds.
9. Maintain temperature control under 260°C (500°F) when soldering.

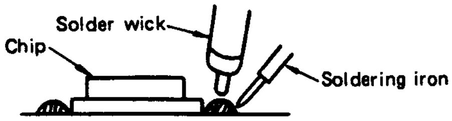
5-1 Removal (Transistor, Diode, Resistor and Capacitor)

1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning it with tweezers.
   Note Be careful not to damage other chips.

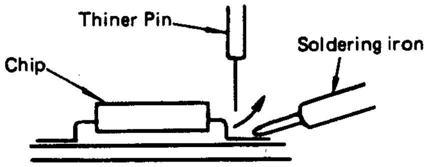

Tweezers
Chip
Soldering iron

5-2 Removal (IC)

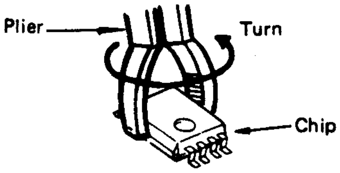
1. Add the solder wick and solder iron to each the IC and remove solder.


Solder wick
Chip
Soldering iron

2. Add the solder iron to each lead of the IC and left each lead of the IC using thiner pin.

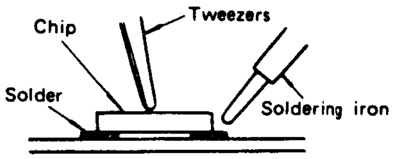

Thiner Pin
Soldering iron
Chip

3. Remove IC turning it with plier.

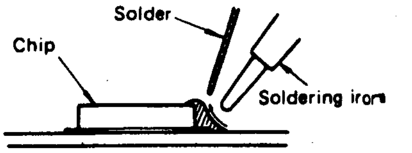

Plier
Turn
Chip

5-3 Mounting

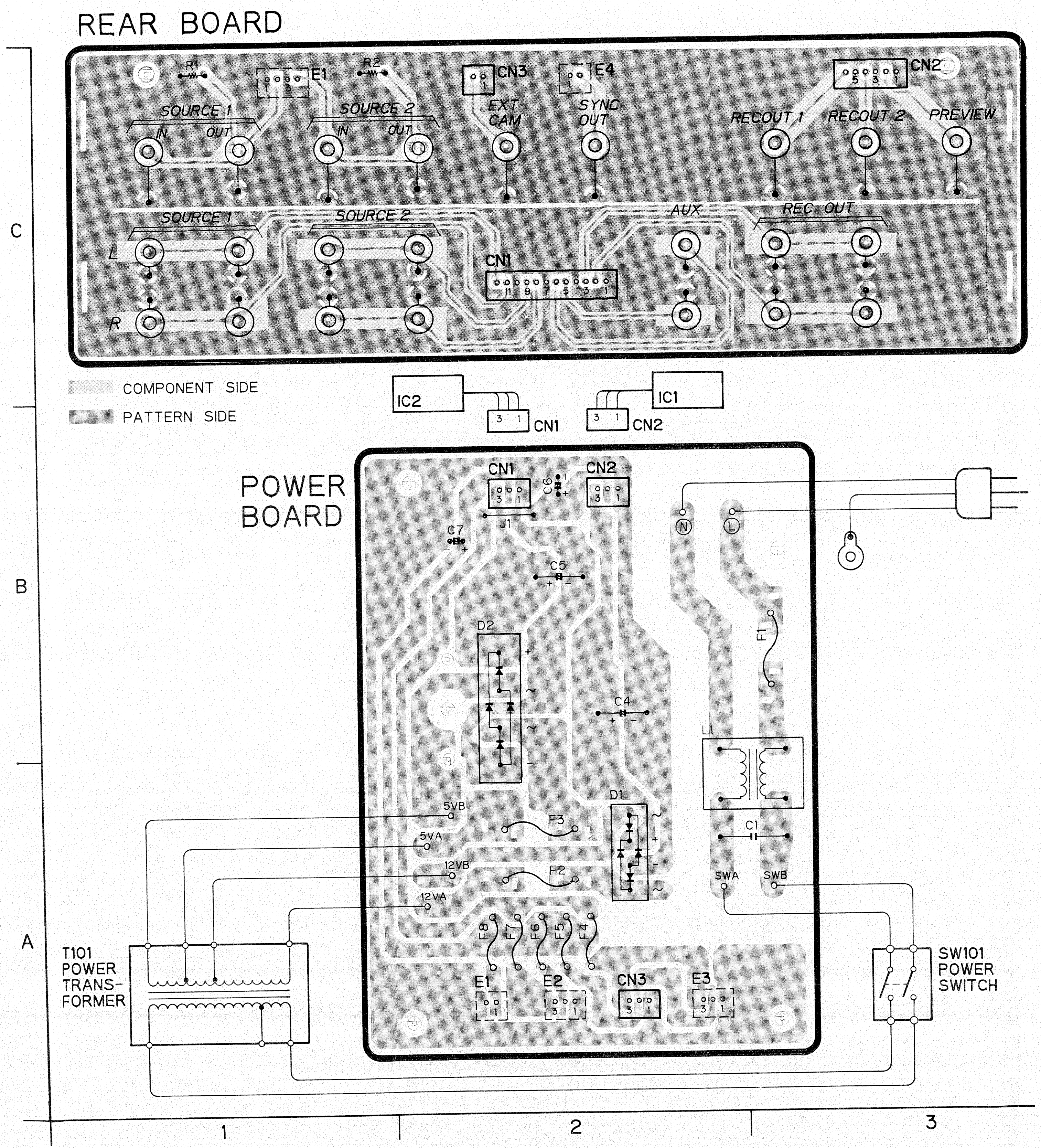
1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarily while holding the chip with the tweezers.


Chip
Tweezers
Solder
Soldering iron

3. Solder both ends of chip (three leads for chip transistor).


Solder
Chip
Soldering iron

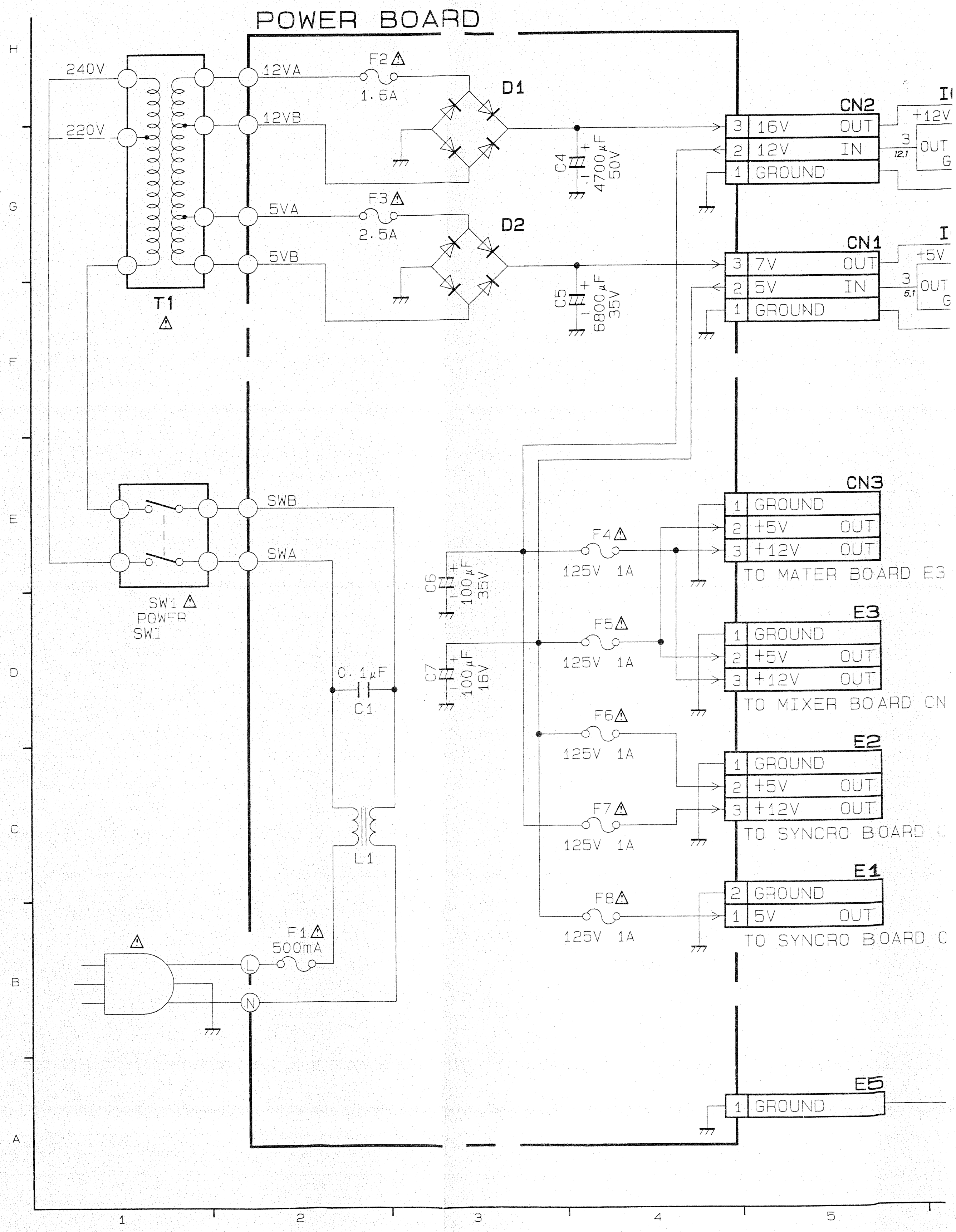
CONDUCTOR VIEW OF REAR BOARD AND POWER BOARD


REAR BOARD
R1
R2
E1
CN3
E4
CN2
SOURCE 1
IN
OUT
SOURCE 2
IN
OUT
EXT CAM
SYNC OUT
RECOUT 1
RECOUT 2
PREVIEW
SOURCE 1
SOURCE 2
AUX
REC OUT
L
R
CN1
COMPONENT SIDE
PATTERN SIDE
IC2
CN1
IC1
CN2
POWER BOARD
CN1
CN2
C6
C7
J1
C5
D2
C4
F1
L1
D1
C1
5VB
5VA
12VB
12VA
F3
F2
SWA
SWB
F8
F7
F6
F5
F4
E1
E2
CN3
E3
N
L
T101 POWER TRANS-FORMER
SW101 POWER SWITCH
A
B
C
1
2
3

POWER BOARD

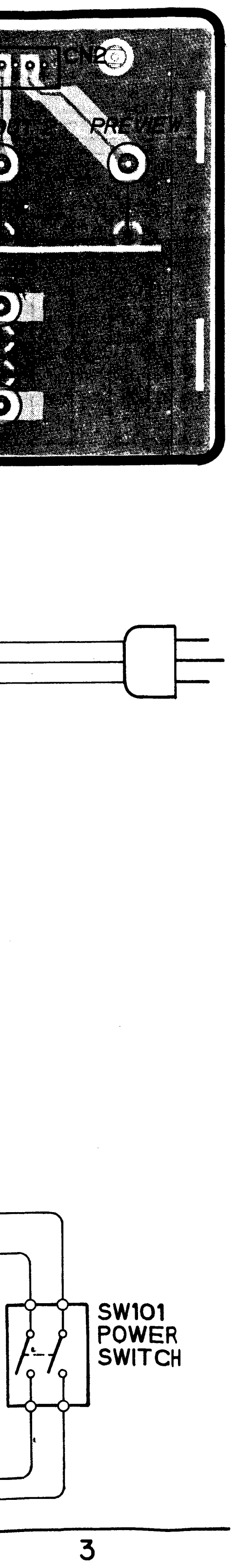
D1	YWRB150F	A2
D2	YWRBV401	B2

SCHEMATIC DIAGRAM OF REAR B

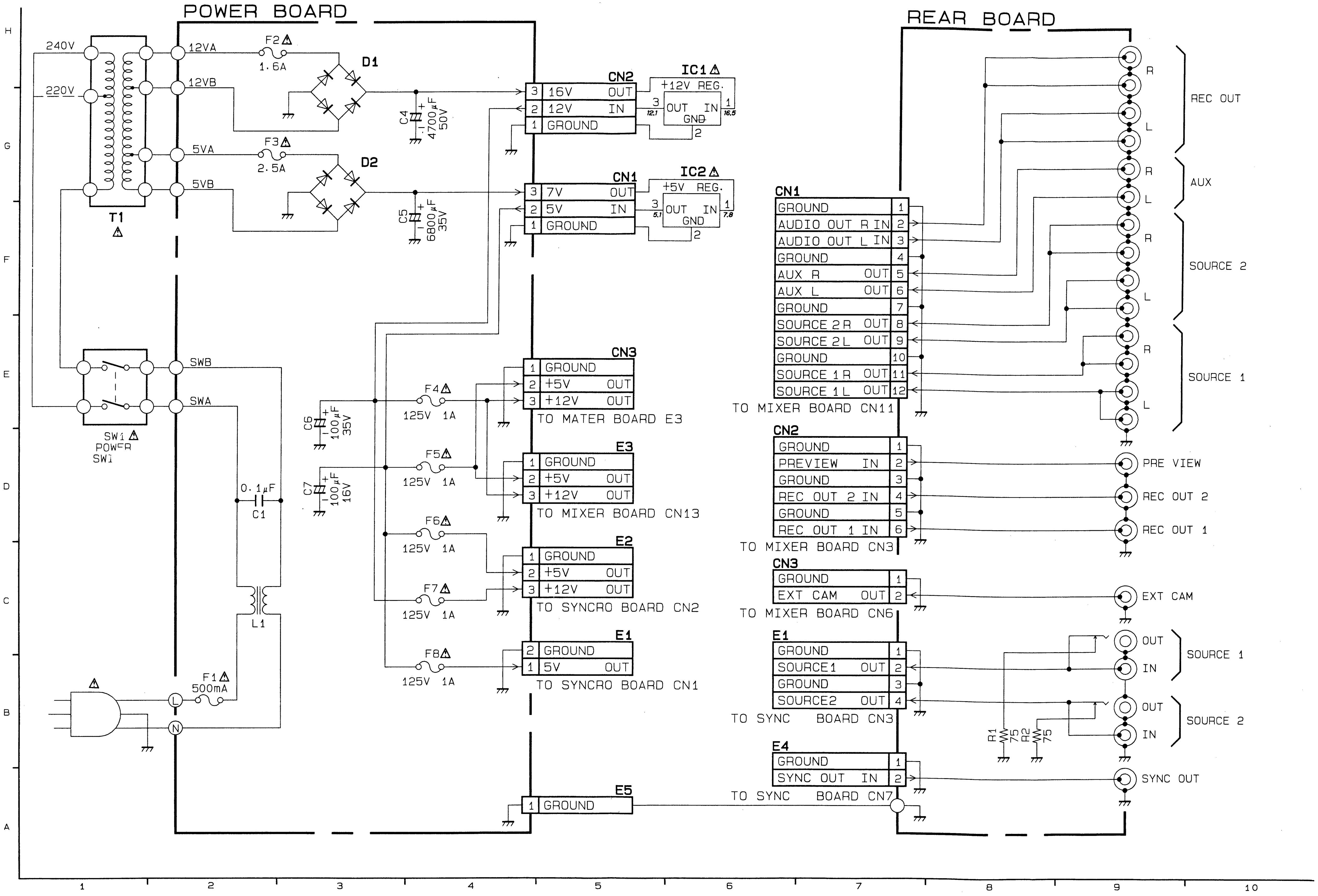

POWER BOARD
240V
220V
T1
12VA
12VB
5VA
5VB
F2
1.6A
F3
2.5A
D1
D2
C4
4700μF 50V
C5
6800μF 35V
CN2
3 16V OUT
2 12V IN
1 GROUND
CN1
3 7V OUT
2 5V IN
1 GROUND
+12V
OUT
+5V
OUT
SWB
SWA
SW1 POWER SW1
0.1μF C1
L1
F1 500mA
L
N
C6 100μF 35V
C7 100μF 16V
F4 125V 1A
F5 125V 1A
F6 125V 1A
F7 125V 1A
F8 125V 1A
CN3
1 GROUND
2 +5V OUT
3 +12V OUT
TO MATER BOARD E3
E3
1 GROUND
2 +5V OUT
3 +12V OUT
TO MIXER BOARD CN
E2
1 GROUND
2 +5V OUT
3 +12V OUT
TO SYNCRO BOARD
E1
2 GROUND
1 5V OUT
TO SYNCRO BOARD C
E5
1 GROUND
A
B
C
D
E
F
G
H
1
2
3
4
5

POWER BOARD

D1	YWRB150F	G3
D2	YWRBV401	H3


PREVIEW
SW101
POWER
SWITCH
3

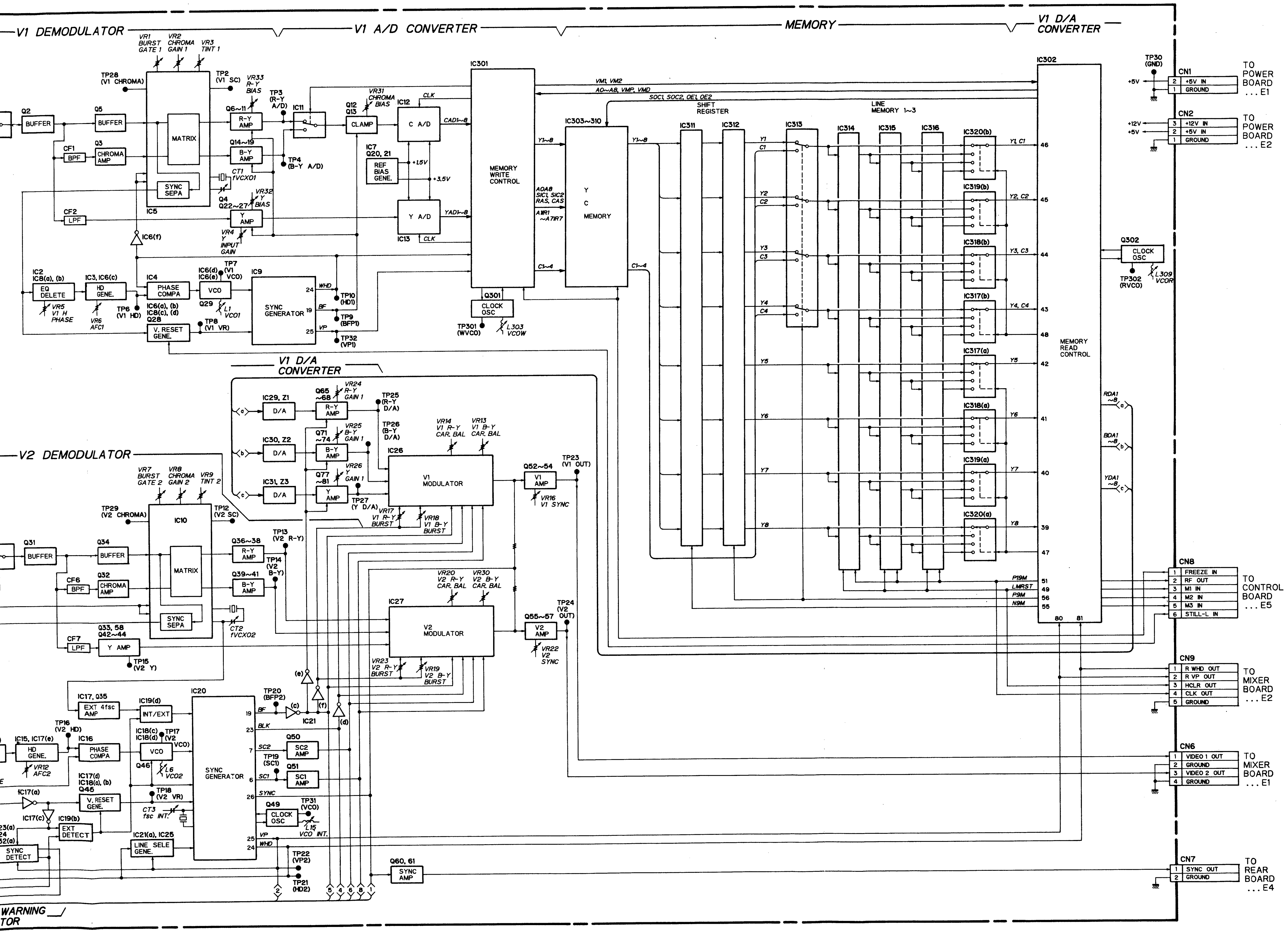
SCHEMATIC DIAGRAM OF REAR BOARD AND POWER BOARD


POWER BOARD
REAR BOARD
H
G
F
E
D
C
B
A
240V
220V
T1
12VA
12VB
5VA
5VB
F2
1.6A
F3
2.5A
D1
D2
C4
4700μF
50V
C5
6800μF
35V
CN2
3 16V OUT
2 12V IN
1 GROUND
IC1
+12V REG.
3 OUT IN 1
12.1
16.5
GND
2
CN1
3 7V OUT
2 5V IN
1 GROUND
IC2
+5V REG.
3 OUT IN 1
5.1
7.8
GND
2
SWB
SWA
SW1
POWER
SW1
0.1μF
C1
L1
F1
500mA
L
N
C6
100μF
35V
C7
100μF
16V
F4
125V 1A
F5
125V 1A
F6
125V 1A
F7
125V 1A
F8
125V 1A
CN3
1 GROUND
2 +5V OUT
3 +12V OUT
TO MATER BOARD E3
E3
1 GROUND
2 +5V OUT
3 +12V OUT
TO MIXER BOARD CN13
E2
1 GROUND
2 +5V OUT
3 +12V OUT
TO SYNCRO BOARD CN2
E1
2 GROUND
1 5V OUT
TO SYNCRO BOARD CN1
E5
1 GROUND
CN1
GROUND 1
AUDIO OUT R IN 2
AUDIO OUT L IN 3
GROUND 4
AUX R OUT 5
AUX L OUT 6
GROUND 7
SOURCE 2 R OUT 8
SOURCE 2 L OUT 9
GROUND 10
SOURCE 1 R OUT 11
SOURCE 1 L OUT 12
TO MIXER BOARD CN11
CN2
GROUND 1
PREVIEW IN 2
GROUND 3
REC OUT 2 IN 4
GROUND 5
REC OUT 1 IN 6
TO MIXER BOARD CN3
CN3
GROUND 1
EXT CAM OUT 2
TO MIXER BOARD CN6
E1
GROUND 1
SOURCE1 OUT 2
GROUND 3
SOURCE2 OUT 4
TO SYNC BOARD CN3
E4
GROUND 1
SYNC OUT IN 2
TO SYNC BOARD CN7
R
L
REC OUT
R
L
AUX
R
L
SOURCE 2
R
L
SOURCE 1
PRE VIEW
REC OUT 2
REC OUT 1
EXT CAM
OUT
IN
SOURCE 1
OUT
IN
SOURCE 2
R1 75
R2 75
SYNC OUT
1
2
3
4
5
6
7
8
9
10

POWER BOARD

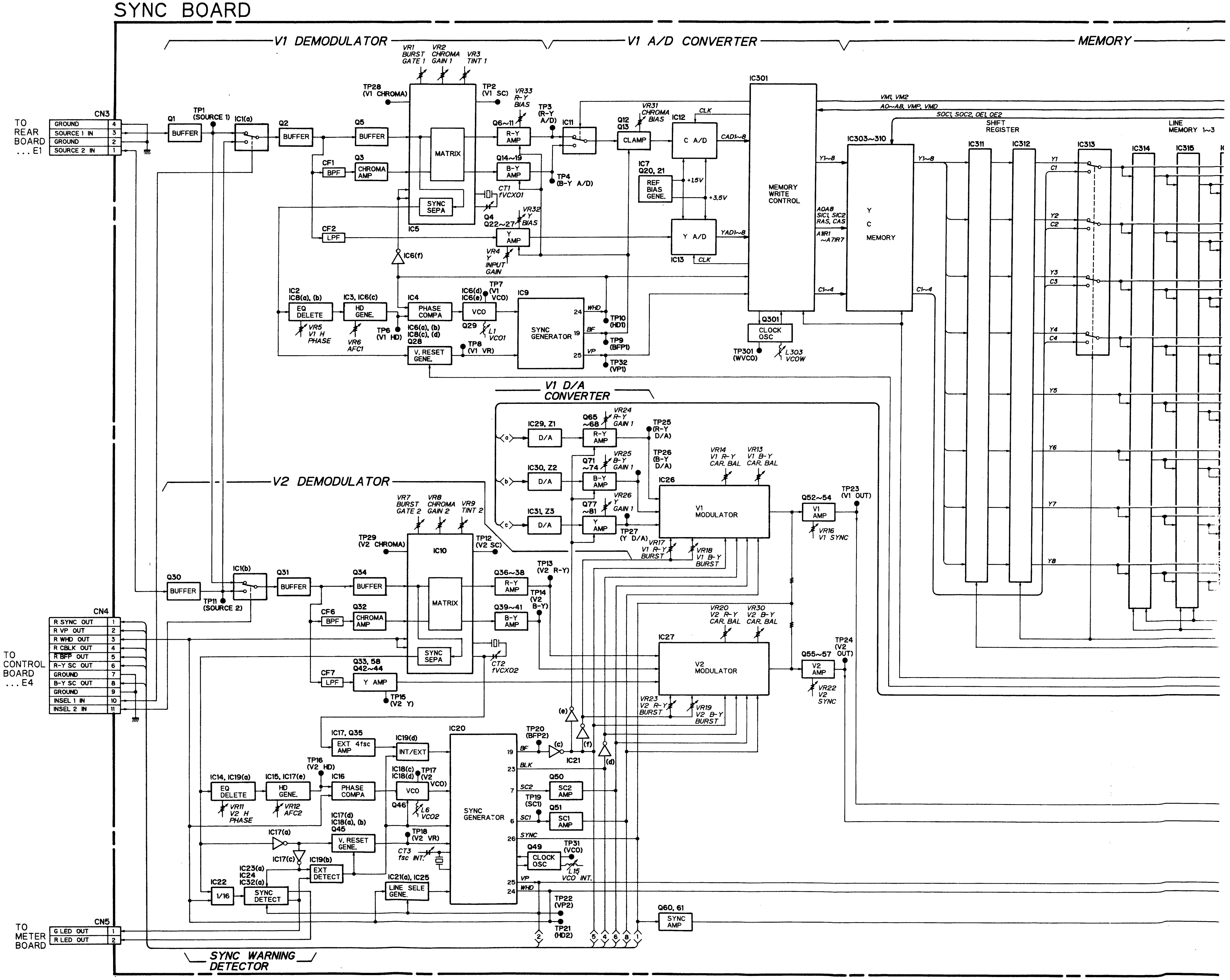
D1	YWRB150F	G3
D2	YWRBV401	H3

BLOCK DIAGRAM OF SYNC BOARD

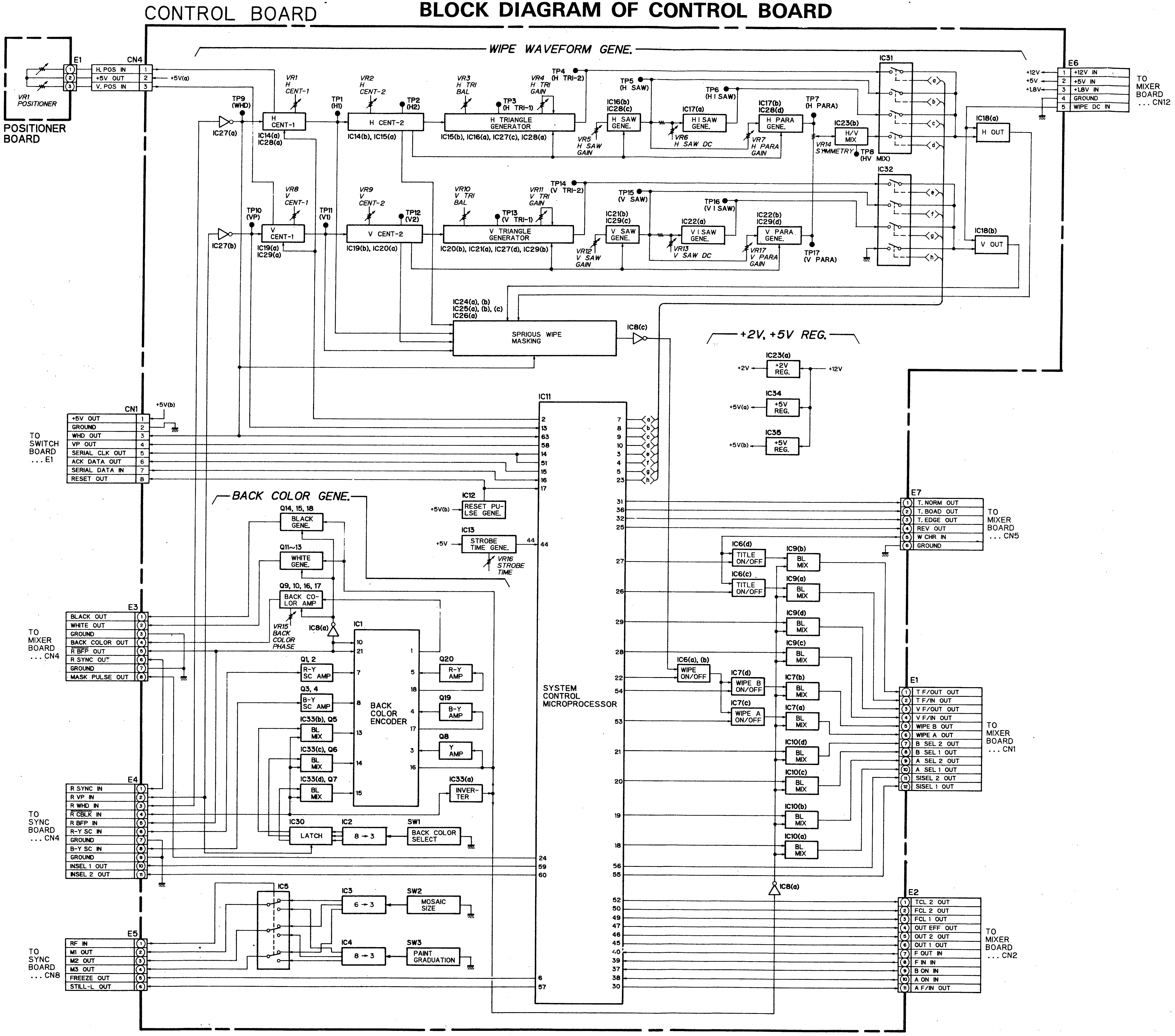


V1 DEMODULATOR
V1 A/D CONVERTER
MEMORY
V1 D/A CONVERTER
VR1 BURST GATE 1
VR2 CHROMA GAIN 1
VR3 TINT 1
TP28 (V1 CHROMA)
TP2 (V1 SC)
VR33 R-Y BIAS
TP3 (R-Y A/D)
IC11
Q12 Q13
VR31 CHROMA BIAS
IC12
CLK
IC301
IC302
TP30 (GND)
Q2
BUFFER
Q5
BUFFER
MATRIX
Q6~11
R-Y AMP
CLAMP
C A/D
CAD1~8
VML VM2
A0~A8, VMP, VMD
SOC1, SOC2, OE1, OE2
SHIFT REGISTER
LINE MEMORY 1~3
CN1
+5V
2 +5V IN
1 GROUND
TO POWER BOARD ... E1
CN2
+12V
+5V
3 +12V IN
2 +5V IN
1 GROUND
TO POWER BOARD ... E2
CF1
BPF
Q3
CHROMA AMP
Q14~19
B-Y AMP
TP4 (B-Y A/D)
IC7 Q20, 21
REF BIAS GENE.
+1.5V
+3.5V
MEMORY WRITE CONTROL
Y1~8
IC303~310
Y C MEMORY
IC311
IC312
IC313
IC314
IC315
IC316
IC320(b)
IC319(b)
IC318(b)
IC317(b)
IC317(a)
IC318(a)
IC319(a)
IC320(a)
Y1, C1
Y2, C2
Y3, C3
Y4, C4
Y5
Y6
Y7
Y8
46
45
44
43
48
42
41
40
39
47
SYNC SEPA
CT1 fVCXO1
VR32 Y BIAS
Q4 Q22~27
IC5
CF2
LPF
Y AMP
Y A/D
YAD1~8
IC13
A0A8 SICL SIC2 RAS, CAS
A1IR1 ~A7IR7
C1~4
IC6(f)
VR4 Y INPUT GAIN
Q302
CLOCK OSC
TP302 (RVCO)
L309 VCOR
IC2 IC8(a), (b)
IC3, IC6(c)
IC4
IC6(d) IC6(e)
TP7 (V1 VCO)
IC9
EQ DELETE
HD GENE.
PHASE COMPA
VCO
SYNC GENERATOR
WHD
BF
VP
24
19
25
TP10 (HD1)
TP9 (BFP1)
TP32 (VP1)
Q301
CLOCK OSC
TP301 (WVCO)
L303 VCOW
VR5 V1 H PHASE
VR6 AFC1
TP6 (V1 HD)
IC6(a), (b) IC8(c), (d) Q28
Q29
L1 VCO1
TP8 (V1 VR)
V. RESET GENE.
MEMORY READ CONTROL
V1 D/A CONVERTER
IC29, Z1
D/A
Q65 ~68
VR24 R-Y GAIN 1
TP25 (R-Y D/A)
RDA1 ~8
BDA1 ~8
YDA1 ~8
(a)
(b)
(c)
IC30, Z2
Q71 ~74
VR25 B-Y GAIN 1
TP26 (B-Y D/A)
VR14 V1 R-Y CAR. BAL
VR13 V1 B-Y CAR. BAL
IC26
V1 MODULATOR
Q52~54
V1 AMP
TP23 (V1 OUT)
IC31, Z3
Q77 ~81
VR26 Y GAIN 1
TP27 (Y D/A)
VR17 V1 R-Y BURST
VR18 V1 B-Y BURST
VR16 V1 SYNC
V2 DEMODULATOR
VR7 BURST GATE 2
VR8 CHROMA GAIN 2
VR9 TINT 2
TP29 (V2 CHROMA)
IC10
TP12 (V2 SC)
TP13 (V2 R-Y)
Q31
BUFFER
Q34
BUFFER
Q36~38
R-Y AMP
TP14 (V2 B-Y)
CF6
BPF
Q32
CHROMA AMP
Q39~41
B-Y AMP
VR20 V2 R-Y CAR. BAL
VR30 V2 B-Y CAR. BAL
IC27
V2 MODULATOR
TP24 (V2 OUT)
Q55~57
V2 AMP
P19M
LMRST
P9M
N9M
51
49
56
55
80
81
CN8
1 FREEZE IN
2 RF OUT
3 M1 IN
4 M2 IN
5 M3 IN
6 STILL-L IN
TO CONTROL BOARD ... E5
SYNC SEPA
CT2 fVCXO2
CF7
LPF
Q33, 58 Q42~44
Y AMP
TP15 (V2 Y)
VR23 V2 R-Y BURST
VR19 V2 B-Y BURST
VR22 V2 SYNC
CN9
1 R WHD OUT
2 R VP OUT
3 HCLR OUT
4 CLK OUT
5 GROUND
TO MIXER BOARD ... E2
IC17, Q35
EXT 4fsc AMP
IC19(d)
INT/EXT
IC20
TP20 (BFP2)
(e)
(c)
(f)
(d)
IC21
TP16 (V2 HD)
IC15, IC17(e)
HD GENE.
IC16
PHASE COMPA
IC18(c) IC18(d)
TP17 (V2 VCO)
VCO
Q46
L6 VCO2
SYNC GENERATOR
BF
BLK
SC2
SC1
SYNC
19
23
7
6
26
25
24
Q50
SC2 AMP
TP19 (SC1)
Q51
SC1 AMP
CN6
1 VIDEO 1 OUT
2 GROUND
3 VIDEO 2 OUT
4 GROUND
TO MIXER BOARD ... E1
VR12 AFC2
IC17(d) IC18(a), (b) Q45
V. RESET GENE.
TP18 (V2 VR)
IC17(a)
IC17(c)
IC19(b)
EXT DETECT
CT3 fsc INT.
Q49
CLOCK OSC
TP31 (VCO)
L15 VCO INT.
VP
WHD
23(a)
24
32(a)
SYNC DETECT
IC21(a), IC25
LINE SELE GENE.
TP22 (VP2)
TP21 (HD2)
Q60, 61
SYNC AMP
CN7
1 SYNC OUT
2 GROUND
TO REAR BOARD ... E4
2
5
4
6
8
1
WARNING
TOR

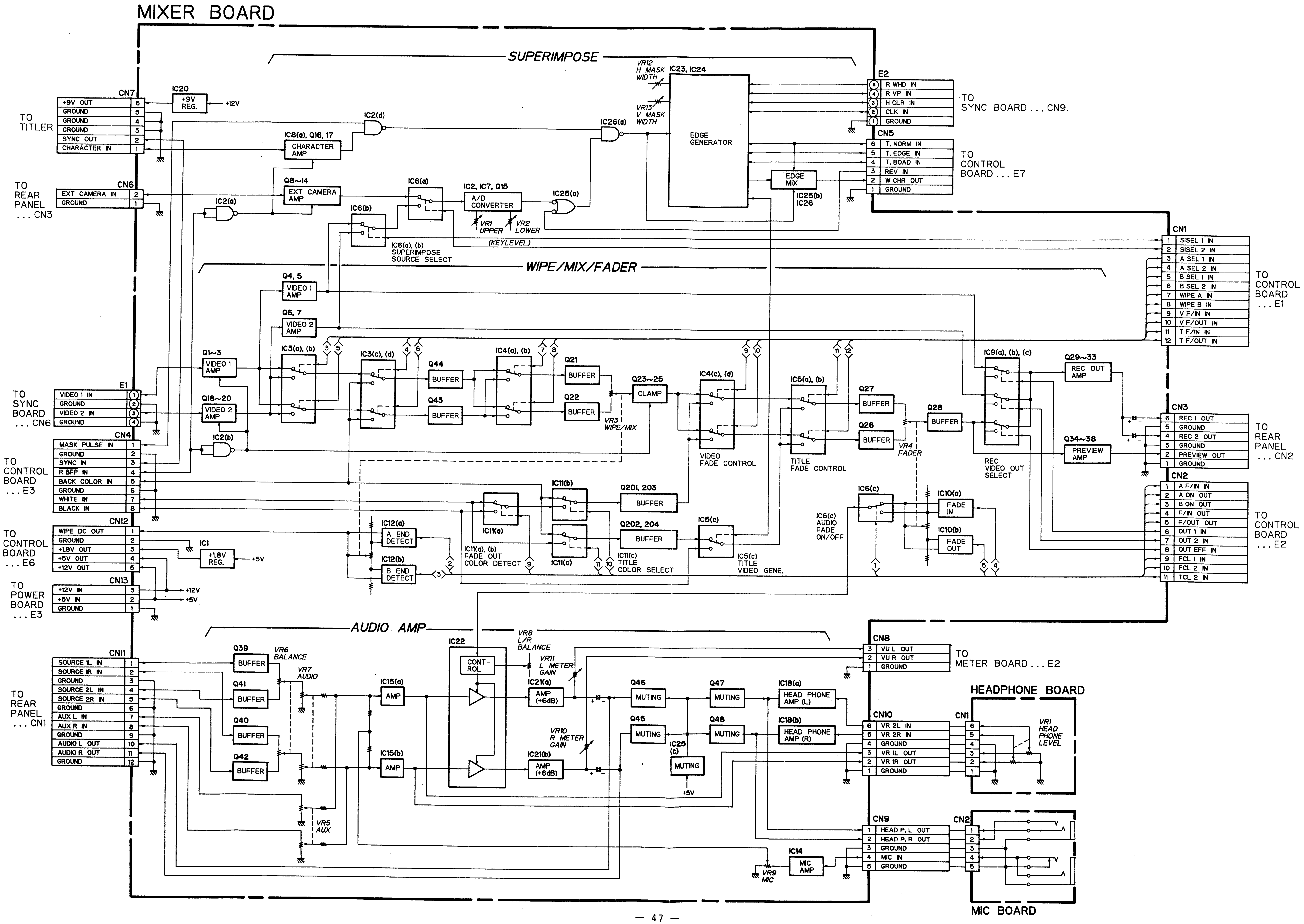
BLOCK DIAGRAM OF SYNC BOARD


SYNC BOARD
V1 DEMODULATOR
V1 A/D CONVERTER
MEMORY
TO REAR BOARD ...E1
CN3
GROUND 4
SOURCE 1 IN 3
GROUND 2
SOURCE 2 IN 1
Q1 BUFFER
TP1 (SOURCE 1)
IC1(a)
Q2 BUFFER
Q5 BUFFER
CF1 BPF
Q3 CHROMA AMP
CF2 LPF
VR1 BURST GATE 1
VR2 CHROMA GAIN 1
VR3 TINT 1
TP28 (V1 CHROMA)
MATRIX
SYNC SEPA
IC5
IC6(f)
TP2 (V1 SC)
VR33 R-Y BIAS
Q6~11 R-Y AMP
Q14~19 B-Y AMP
CT1 fVCXO1
VR32 Y BIAS
Q4 Q22~27 Y AMP
VR4 Y INPUT GAIN
TP3 (R-Y A/D)
TP4 (B-Y A/D)
IC11
VR31 CHROMA BIAS
Q12 Q13 CLAMP
IC12 C A/D
CLK
CAD1~8
IC7 Q20, 21 REF BIAS GENE.
+1.5V
+3.5V
IC13 Y A/D
YAD1~8
IC301 MEMORY WRITE CONTROL
VM1, VM2
AO~A8, VMP, VMD
SOC1, SOC2, OE1, OE2
SHIFT REGISTER
LINE MEMORY 1~3
IC303~310 Y C MEMORY
Y1~8
A0A8 SIC1, SIC2 RAS, CAS
A1R1 ~A7R7
C1~4
Q301 CLOCK OSC
TP301 (WVCO)
L303 VCOW
IC311
IC312
IC313
IC314
IC315
Y1 C1 Y2 C2 Y3 C3 Y4 C4 Y5 Y6 Y7 Y8
IC2 IC8(a), (b) EQ DELETE
VR5 V1 H PHASE
IC3, IC6(c) HD GENE.
VR6 AFC1
TP6 (V1 HD)
IC4 PHASE COMPA
IC6(d) IC6(e)
TP7 (V1 VCO)
VCO
Q29 L1 VCO1
IC6(a), (b) IC8(c), (d) Q28 V. RESET GENE.
TP8 (V1 VR)
IC9 SYNC GENERATOR
24 WHD 19 BF 25 VP
TP10 (HD1)
TP9 (BFP1)
TP32 (VP1)
V1 D/A CONVERTER
IC29, Z1 D/A
IC30, Z2 D/A
IC31, Z3 D/A
Q65~68 R-Y AMP VR24 R-Y GAIN 1
Q71~74 B-Y AMP VR25 B-Y GAIN 1
Q77~81 Y AMP VR26 Y GAIN 1
TP25 (R-Y D/A)
TP26 (B-Y D/A)
TP27 (Y D/A)
VR14 V1 R-Y CAR. BAL
VR13 V1 B-Y CAR. BAL
IC26 V1 MODULATOR
VR17 V1 R-Y BURST
VR18 V1 B-Y BURST
Q52~54 V1 AMP
VR16 V1 SYNC
TP23 (V1 OUT)
V2 DEMODULATOR
VR7 BURST GATE 2
VR8 CHROMA GAIN 2
VR9 TINT 2
TP29 (V2 CHROMA)
IC10
TP12 (V2 SC)
IC1(b)
Q30 BUFFER
TP11 (SOURCE 2)
Q31 BUFFER
Q34 BUFFER
CF6 BPF
Q32 CHROMA AMP
CF7 LPF
Q33, 58 Q42~44 Y AMP
TP15 (V2 Y)
CT2 fVCXO2
Q36~38 R-Y AMP
TP13 (V2 R-Y)
Q39~41 B-Y AMP
TP14 (V2 B-Y)
VR20 V2 R-Y CAR. BAL
VR30 V2 B-Y CAR. BAL
IC27 V2 MODULATOR
VR23 V2 R-Y BURST
VR19 V2 B-Y BURST
Q55~57 V2 AMP
VR22 V2 SYNC
TP24 (V2 OUT)
TO CONTROL BOARD ...E4
CN4
R SYNC OUT 1
R VP OUT 2
R WHD OUT 3
R CBLK OUT 4
R BFP OUT 5
R-Y SC OUT 6
GROUND 7
B-Y SC OUT 8
GROUND 9
INSEL 1 IN 10
INSEL 2 IN 11
IC17, Q35 EXT 4fsc AMP
IC19(d) INT/EXT
IC20 SYNC GENERATOR
TP20 (BFP2)
IC21
19 BF 23 BLK 7 SC2 6 SC1 26 SYNC 25 VP 24 WHD
Q50 SC2 AMP
TP19 (SC1)
Q51 SC1 AMP
Q49 CLOCK OSC
TP31 (VCO)
L15 VCO INT.
TP16 (V2 HD)
IC14, IC19(a) EQ DELETE
VR11 V2 H PHASE
IC15, IC17(e) HD GENE.
VR12 AFC2
IC16 PHASE COMPA
IC18(c) IC18(d)
TP17 (V2 VCO)
VCO
Q46 L6 VCO2
IC17(d) IC18(a), (b) Q45 V. RESET GENE.
TP18 (V2 VR)
CT3 fsc INT.
IC17(a)
IC17(c)
IC19(b) EXT DETECT
IC22 1/16
IC23(a) IC24 IC32(a) SYNC DETECT
IC21(a), IC25 LINE SELE GENE.
TP22 (VP2)
TP21 (HD2)
Q60, 61 SYNC AMP
(a) (b) (c) (d) (e) (f)
TO METER BOARD
CN5
G LED OUT 1
R LED OUT 2
SYNC WARNING DETECTOR

BLOCK DIAGRAM OF CONTROL BOARD


CONTROL BOARD
POSITIONER BOARD
VR1 POSITIONER
E1
CN4
H. POS IN
+5V OUT
V. POS IN
+5V(a)
WIPE WAVEFORM GENE.
TP9 (WHD)
IC27(a)
H CENT-1
IC14(a) IC28(a)
VR1 H CENT-1
TP1 (H1)
VR2 H CENT-2
TP2 (H2)
H CENT-2
IC14(b), IC15(a)
VR3 H TRI BAL
TP3 (H TRI-1)
VR4 H TRI GAIN
TP4 (H TRI-2)
H TRIANGLE GENERATOR
IC15(b), IC16(a), IC27(c), IC28(a)
TP5 (H SAW)
IC16(b) IC28(c)
H SAW GENE.
VR5 H SAW GAIN
TP6 (H I SAW)
IC17(a)
H I SAW GENE.
VR6 H SAW DC
IC17(b) IC28(d)
H PARA GENE.
VR7 H PARA GAIN
TP7 (H PARA)
IC23(b)
H/V MIX
VR14 SYMMETRY
TP8 (HV MIX)
IC31
IC18(a)
H OUT
E6
+12V IN
+5V IN
+1.8V IN
GROUND
WIPE DC IN
+12V
+5V
+1.8V
TO MIXER BOARD ... CN12
TP10 (VP)
IC27(b)
V CENT-1
IC19(a) IC29(a)
VR8 V CENT-1
TP11 (V1)
VR9 V CENT-2
TP12 (V2)
V CENT-2
IC19(b), IC20(a)
VR10 V TRI BAL
TP13 (V TRI-1)
VR11 V TRI GAIN
TP14 (V TRI-2)
V TRIANGLE GENERATOR
IC20(b), IC21(a), IC27(d), IC29(b)
TP15 (V SAW)
IC21(b) IC29(c)
V SAW GENE.
VR12 V SAW GAIN
TP16 (V I SAW)
IC22(a)
V I SAW GENE.
VR13 V SAW DC
IC22(b) IC29(d)
V PARA GENE.
VR17 V PARA GAIN
TP17 (V PARA)
IC32
IC18(b)
V OUT
IC24(a), (b) IC25(a), (b), (c) IC26(a)
SPRIOUS WIPE MASKING
IC8(c)
+2V, +5V REG.
IC23(a)
+2V REG.
+2V
+12V
IC34
+5V REG.
+5V(a)
IC35
+5V(b)
CN1
+5V(b)
+5V OUT
GROUND
WHD OUT
VP OUT
SERIAL CLK OUT
ACK DATA OUT
SERIAL DATA IN
RESET OUT
TO SWITCH BOARD ... E1
IC11
SYSTEM CONTROL MICROPROCESSOR
BACK COLOR GENE.
Q14, 15, 18
BLACK GENE.
Q11~13
WHITE GENE.
Q9, 10, 16, 17
BACK COLOR AMP
VR15 BACK COLOR PHASE
IC8(a)
IC1
BACK COLOR ENCODER
Q1, 2
R-Y SC AMP
Q3, 4
B-Y SC AMP
IC33(b), Q5
BL MIX
IC33(c), Q6
BL MIX
IC33(d), Q7
BL MIX
Q20
R-Y AMP
Q19
B-Y AMP
Q8
Y AMP
IC33(a)
INVERTER
IC30
LATCH
IC2
8→3
SW1
BACK COLOR SELECT
IC12
RESET PULSE GENE.
+5V(b)
IC13
STROBE TIME GENE.
+5V
VR16 STROBE TIME
E3
BLACK OUT
WHITE OUT
GROUND
BACK COLOR OUT
R BFP OUT
R SYNC OUT
GROUND
MASK PULSE OUT
TO MIXER BOARD ... CN4
E4
R SYNC IN
R VP IN
R WHD IN
R CBLK IN
R BFP IN
R-Y SC IN
GROUND
B-Y SC IN
GROUND
INSEL 1 OUT
INSEL 2 OUT
TO SYNC BOARD ... CN4
IC5
IC3
6→3
SW2
MOSAIC SIZE
IC4
8→3
SW3
PAINT GRADUATION
E5
RF IN
M1 OUT
M2 OUT
M3 OUT
FREEZE OUT
STILL-L OUT
TO SYNC BOARD ... CN8
E7
T. NORM OUT
T. BOAD OUT
T. EDGE OUT
REV OUT
W CHR IN
GROUND
TO MIXER BOARD ... CN5
IC6(d)
TITLE ON/OFF
IC6(c)
TITLE ON/OFF
IC6(a), (b)
WIPE ON/OFF
IC7(d)
WIPE B ON/OFF
IC7(c)
WIPE A ON/OFF
IC9(b)
IC9(a)
IC9(d)
IC9(c)
IC7(b)
IC7(a)
IC10(d)
IC10(c)
IC10(b)
IC10(a)
BL MIX
IC8(a)
E1
T F/OUT OUT
T F/IN OUT
V F/OUT OUT
V F/IN OUT
WIPE B OUT
WIPE A OUT
B SEL 2 OUT
B SEL 1 OUT
A SEL 2 OUT
A SEL 1 OUT
SISEL 2 OUT
SISEL 1 OUT
TO MIXER BOARD ... CN1
E2
TCL 2 OUT
FCL 2 OUT
FCL 1 OUT
OUT EFF OUT
OUT 2 OUT
OUT 1 OUT
F OUT IN
F IN IN
B ON IN
A ON IN
A F/IN OUT
TO MIXER BOARD ... CN2

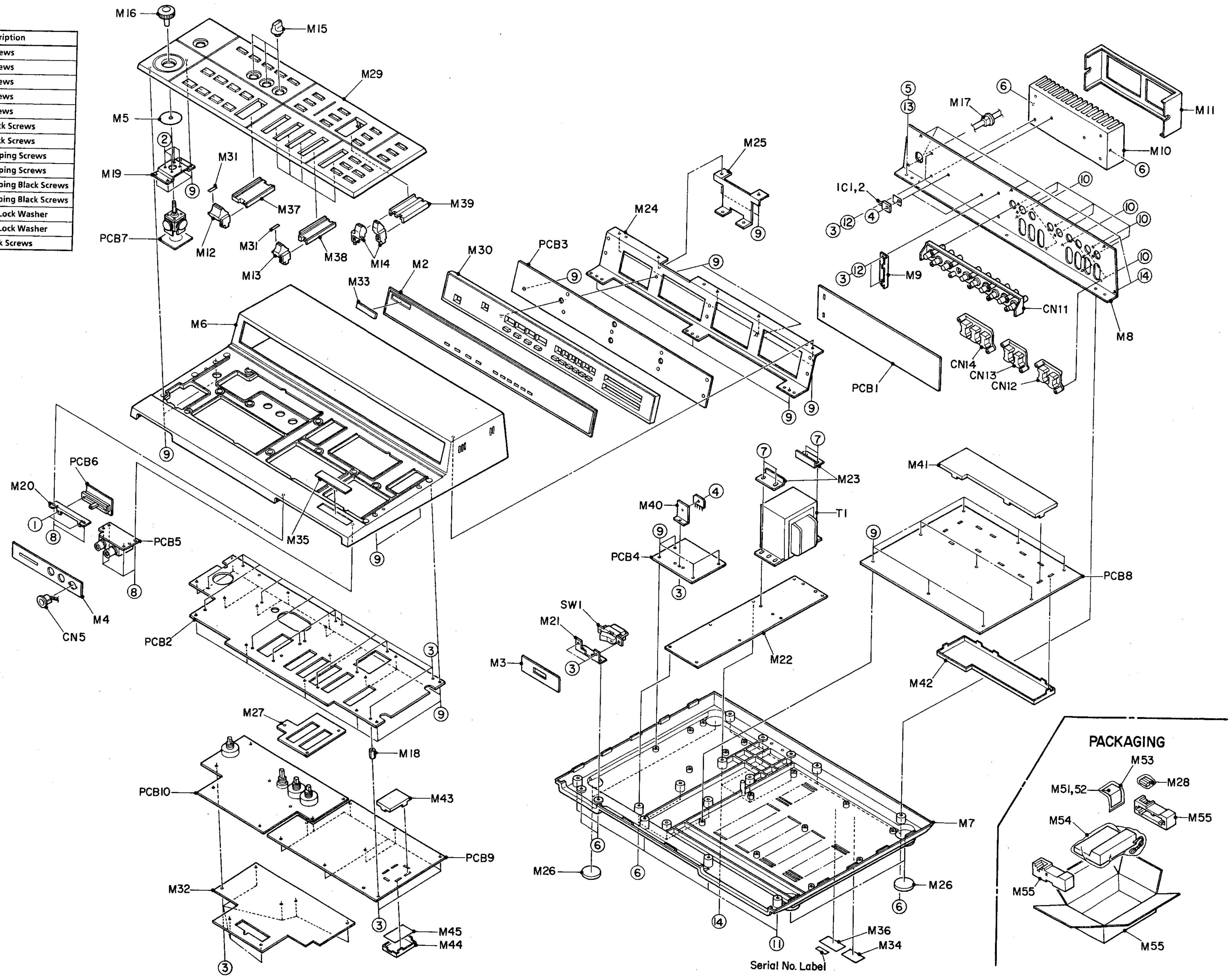
BLOCK DIAGRAM OF MIXER BOARD


MIXER BOARD
SUPERIMPOSE
WIPE/MIX/FADER
AUDIO AMP
TO TITLER
CN7
+9V OUT 6
GROUND 5
GROUND 4
GROUND 3
SYNC OUT 2
CHARACTER IN 1
IC20
+9V REG.
+12V
TO REAR PANEL ... CN3
CN6
EXT CAMERA IN 2
GROUND 1
IC2(d)
IC8(a), Q16, 17
CHARACTER AMP
Q8~14
EXT CAMERA AMP
IC2(a)
IC6(a)
IC6(b)
IC6(a), (b) SUPERIMPOSE SOURCE SELECT
IC2, IC7, Q15
A/D CONVERTER
VR1 UPPER
VR2 LOWER
(KEYLEVEL)
IC25(a)
IC26(a)
VR12 H MASK WIDTH
VR13 V MASK WIDTH
IC23, IC24
EDGE GENERATOR
EDGE MIX
IC25(b) IC26
E2
R WHD IN 5
R VP IN 4
H CLR IN 3
CLK IN 2
GROUND 1
TO SYNC BOARD ... CN9.
CN5
T. NORM IN 6
T. EDGE IN 5
T. BOAD IN 4
REV IN 3
W CHR OUT 2
GROUND 1
TO CONTROL BOARD ... E7
CN1
SISEL 1 IN 1
SISEL 2 IN 2
A SEL 1 IN 3
A SEL 2 IN 4
B SEL 1 IN 5
B SEL 2 IN 6
WIPE A IN 7
WIPE B IN 8
V F/IN IN 9
V F/OUT IN 10
T F/IN IN 11
T F/OUT IN 12
TO CONTROL BOARD ... E1
Q4, 5
VIDEO 1 AMP
Q6, 7
VIDEO 2 AMP
Q1~3
VIDEO 1 AMP
Q18~20
VIDEO 2 AMP
IC2(b)
IC3(a), (b)
3 5
IC3(c), (d)
4 6
Q44
BUFFER
Q43
BUFFER
IC4(a), (b)
7 8
Q21
BUFFER
Q22
BUFFER
VR3 WIPE/MIX
Q23~25
CLAMP
IC4(c), (d)
9 10
VIDEO FADE CONTROL
IC5(a), (b)
11 12
TITLE FADE CONTROL
Q27
BUFFER
Q26
BUFFER
VR4 FADER
Q28
BUFFER
IC9(a), (b), (c)
REC VIDEO OUT SELECT
Q29~33
REC OUT AMP
Q34~38
PREVIEW AMP
TO SYNC BOARD ... CN6
E1
VIDEO 1 IN 1
GROUND 2
VIDEO 2 IN 3
GROUND 4
TO CONTROL BOARD ... E3
CN4
MASK PULSE IN 1
GROUND 2
SYNC IN 3
R BFP IN 4
BACK COLOR IN 5
GROUND 6
WHITE IN 7
BLACK IN 8
TO CONTROL BOARD ... E6
CN12
WIPE DC OUT 1
GROUND 2
+1.8V OUT 3
+5V OUT 4
+12V OUT 5
IC1
+1.8V REG.
+5V
TO POWER BOARD ... E3
CN13
+12V IN 3
+5V IN 2
GROUND 1
+12V
+5V
IC12(a)
A END DETECT
IC12(b)
B END DETECT
2
3
IC11(a)
IC11(b)
IC11(c)
IC11(a), (b) FADE OUT COLOR DETECT
9
11 10
IC11(c) TITLE COLOR SELECT
Q201, 203
BUFFER
Q202, 204
BUFFER
IC5(c)
IC5(c) TITLE VIDEO GENE.
IC6(c)
IC6(c) AUDIO FADE ON/OFF
1
IC10(a)
FADE IN
IC10(b)
FADE OUT
5 4
CN3
REC 1 OUT 6
GROUND 5
REC 2 OUT 4
GROUND 3
PREVIEW OUT 2
GROUND 1
TO REAR PANEL ... CN2
CN2
A F/IN IN 1
A ON OUT 2
B ON OUT 3
F/IN OUT 4
F/OUT OUT 5
OUT 1 IN 6
OUT 2 IN 7
OUT EFF IN 8
FCL 1 IN 9
FCL 2 IN 10
TCL 2 IN 11
TO CONTROL BOARD ... E2
TO REAR PANEL ... CN1
CN11
SOURCE 1L IN 1
SOURCE 1R IN 2
GROUND 3
SOURCE 2L IN 4
SOURCE 2R IN 5
GROUND 6
AUX L IN 7
AUX R IN 8
GROUND 9
AUDIO L OUT 10
AUDIO R OUT 11
GROUND 12
Q39
BUFFER
Q41
BUFFER
Q40
BUFFER
Q42
BUFFER
VR6 BALANCE
VR7 AUDIO
VR5 AUX
IC15(a)
AMP
IC15(b)
AMP
IC22
CONT-ROL
VR8 L/R BALANCE
VR11 L METER GAIN
VR10 R METER GAIN
IC21(a)
AMP (+6dB)
IC21(b)
AMP (+6dB)
Q46
MUTING
Q45
MUTING
Q47
MUTING
Q48
MUTING
IC25 (c)
MUTING
+5V
IC18(a)
HEAD PHONE AMP (L)
IC18(b)
HEAD PHONE AMP (R)
IC14
MIC AMP
VR9 MIC
CN8
VU L OUT 3
VU R OUT 2
GROUND 1
TO METER BOARD ... E2
CN10
VR 2L IN 6
VR 2R IN 5
GROUND 4
VR 1L OUT 3
VR 1R OUT 2
GROUND 1
HEADPHONE BOARD
CN1
VR1 HEAD PHONE LEVEL
CN9
HEAD P. L OUT 1
HEAD P. R OUT 2
GROUND 3
MIC IN 4
GROUND 5
CN2
MIC BOARD

EXPLODED VIEW

○ Numbers show screws.

No.	Screws	Description
①	XSB2 + 4FX	Binding Head Screws
②	XSB26 + 6FX	Binding Head Screws
③	XSB3 + 6FX	Binding Head Screws
④	XSB3 + 10FX	Binding Head Screws
⑤	XSB4 + 6FX	Binding Head Screws
⑥	XSB3 + 6FXK	Binding Head Black Screws
⑦	XSB4 + 6FXK	Binding Head Black Screws
⑧	XTB3 + 6CFX	Binding Head Tapping Screws
⑨	XTB3 + 8CFX	Binding Head Tapping Screws
⑩	XTB3 + 8CFXK	Binding Head Tapping Black Screws
⑪	XTB3 + 14CFXK	Binding Head Tapping Black Screws
⑫	XWC3BFX	External Toothed Lock Washer
⑬	XWC4BFX	External Toothed Lock Washer
⑭	XSB3 + 8FXK	Binding Head Black Screws


M16
M15
M29
M5
②
M19
⑨
M31
M37
M39
PCB7
M31
M12
M13
M38
M14
M2
M33
M30
PCB3
⑨
M24
M25
⑨
⑨
⑤
⑬
M17
⑥
M11
M10
⑥
IC1,2
③
⑫
④
⑩
⑩
⑩
⑩
⑭
③
⑫
M9
CN11
M8
PCB1
CN14
CN13
CN12
M6
⑨
⑨
⑨
PCB6
M20
①
⑧
PCB5
M35
⑨
⑧
M4
CN5
⑦
⑦
M23
T1
M40
④
⑨
PCB4
③
M41
⑨
PCB8
SW1
M21
③
M3
M22
PCB2
③
⑨
M42
M27
M18
M43
PCB10
PCB9
M32
③
M45
M44
③
M26
⑥
⑥
M7
M26
⑥
⑭
⑪
M36
M34
Serial No. Label
PACKAGING
M53
M51,52
M28
M54
M55
M55
M55

REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "⚠" mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Components identified by "o" mark are new parts used from this model.
3. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

PRODUCTION MIXER

MISCELLANEOUS

REF.NO.	PART NO.	DESCRIPTION	
T1 ⚠	YWPTMX10E	Power Transformer	
SW1 ⚠	YWEST15767V	Power Switch	
CN5	o YWD0111N611	Title Connector Assy	
CN10	YWACJ450/B	AC Power Cord for WJ-MX10/B	
	YWACJ450/C	AC Power Cord for WJ-MX10/C	
	YWACJ450/G	AC Power Cord for WJ-MX10/G	
	YWACJ450/A	AC Power Cord for WJ-MX10/A	
M2	o YWV5WA0798A2	Display Panel	
M3	o YWV5WA0823A4	Panel	
M4	o YWV5WA0824A4	Mic Jack Panel	
M5	o YWV5WA0825A4	Stic Insulater Sheet	
M6 ⚠	o YWV5EA0561A1	Upper Cover	
M7 ⚠	o YWV5EA0562B1	Bottom Cover	
M8	o YWV5EA0569A2	Rear Panel	
M9	YWV2SA1235A4	Mounting Angle	
M10	o YWV7DA0202A3	Heat Sink	
M11	o YWV7DA0204A3	Heat Sink Cover	
M12	o YWV5RA0200A4	Knob	
M13	o YWV5RA0201A4	Knob	
M14	o YWV5RA0202A4	Knob	
M15	o YWV5RA0203A4	Knob (X4)	
M16	o YWV5RA0204A4	Stic Knob	
M17	YWSR6W-1	Cord Clamp	
M18	o YWV1BA0009A4	Support	
M19	o YWV2SA1200A4	Mounting Angle for Stic	
M20	o YWV2SA1201A4	Mounting Angle for VR	
M21	o YWV2SA1202B4	Mounting Angle for Power switch	
M22	o YWV2SA1203B3	Mounting Plate for Transformer	
M23	o YWV2SA1205A4	Mounting Angle	
M24	o YWV2SA1206A2	Mounting Angle	
M25	o YWV2SA1266A3	Mounting Angle	
M26	o YWV5LA0036A4	Rubber Foot	
M27	o YWV2HA0589A4	Shield Parts	
M29	o YWV9AA0489BN	Mechanical Ass'y	
M30	o YWV9AA0521AN	Mechanical Ass'y	
M31	YWV2FA0355A4	Cushion	
M32	o YWV2PA0288A4	Insulator	
M33	NA-526PB7G	Badge	
M34 ⚠	o YFV7MA0099A4	Safety Label	
M35	o YWV7PA0060A4	Badge	
M36 ⚠	o YWV7QA1593A4	Main Label for WJ-MX10/A	
⚠	o YWV7QA1594A4	Main Label for WJ-MX10/B	
⚠	o YWV7QA1595A4	Main Label for WJ-MX10/C	
⚠	o YWV7QA1596A4	Main Label for WJ-MX10/G	
M37	o YWV2EA0088A4	Guide	
M38	o YWV2EA0089A4	Guide	
M39	o YWV2EA0090A4	Guide	

REAR BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB1	o YWJRYMX10E1B	Printed Board	
R1,2	ERDS2TJ750	Carbon	75 ohms 1/4W
CN1-JM	EMCS0650Z	6 pin Jack Male	
CN2-JM	EMCS1250Z	12 pin Jack Male	
CN3-JM	EMCS0250Z	2 pin Jack Male	
CN11	YWB0065	9 pin BNC Connector	
CN12,13	YWT5757DA	4 pin Jack Unit	
CN14	YWT5758AADA	6 pin Jack Unit	

SWITCH BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB2 (NLA)	o YWJKBMX10E1A	Printed Circuit Board Assy	
IC1	MN15542CCE1	IC	
IC2	AN90B20	IC	
Q1-5	2SB641-QR	Transistor	
D1-30	YWGL1HS211	Diode	
D31-35	MA165	Diode	
R1-5	ERDS2TJ392	Carbon	3.9K ohms 1/4W
R6-10	ERDS2TJ220	Carbon	22 ohms 1/4W
Z1	EXBRB8271J	Block Resistor	
Z2	EXBRB8220J	Block Resistor	
C1-13	ECKF1H103KB	Ceramic	0.01 µF 50V
C14	ECQM1H104JZ	Plastic	0.1 µF 50V
C15,16	ECEA1AKA221	Electrolytic	220 µF 10V
C17	ECQM1H104JZ	Plastic	0.1 µF 50V
C18,19	ECCF1H330JC	Ceramic	33 pF 50V
C20	ECQM1H104JZ	Plastic	0.1 µF 50V
L1,2	YWLAL2KR8R2K	Coil	8.2 µH
SW1-30	YWSKHHPR906	Push Switch	
X1	KBR-3.58MS	Oscillator	
J2	ERD25TC0	Jamper Resister	

METER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB3 (NLA)	o YWJKCMX10E1A	Printed Circuit Board Assy	
IC1	YWBA6822S	IC	
IC3	MN40175B	IC	
IC4	MN40174B	IC	
IC5	AN78N05	IC	
Q1-4	2SB641-QR	Transistor	
Q5-16	2SD636-Q	Transistor	
D1-4	YWLT9230H	Diode	
D5-10	YWLT9000N	Diode	
D11	YWLT9000D	Diode	
D12	YWLT9002ND	Diode	
D13,14	YWGL112F13	Diode	
D15,16	MA165	Diode	
R1-6	ERDS2TJ151	Carbon	150 ohms 1/4W
R7,8	ERDS2TJ103	Carbon	10K ohms 1/4W
R9	ERDS2TJ183	Carbon	18K ohms 1/4W
R10-13	ERDS2TJ102	Carbon	1K ohms 1/4W
R14	ERDS2FJ331	Carbon	330 ohms 1/4W
R15	ERDS2TJ332	Carbon	3.3K ohms 1/4W
R16	ERDS2FJ331	Carbon	330 ohms 1/4W
R17	ERDS2TJ332	Carbon	3.3K ohms 1/4W
R18	ERDS2FJ331	Carbon	330 ohms 1/4W
R19	ERDS2TJ332	Carbon	3.3K ohms 1/4W
R20	ERDS2FJ331	Carbon	330 ohms 1/4W
R21	ERDS2TJ332	Carbon	3.3K ohms 1/4W
R23,25	ERDS2TJ680	Carbon	68 ohms 1/4W
R27,29	ERDS2TJ680	Carbon	68 ohms 1/4W
R31,33	ERDS2TJ680	Carbon	68 ohms 1/4W
R34	ERDS2TJ511	Carbon	510 ohms 1/4W
R35	ERG1SJ100	Metal	10 ohms 1W
R36	ERDS2TJ820	Carbon	82 ohms 1/4W
R37	ERDS2TJ121	Carbon	120 ohms 1/4W
C1,2	ECEA1EK100	Electrolytic	10 µF 10V
C3	ECQB1H103JZ	Plastic	0.01 µF 50V
C4	ECEA1AU101	Electrolytic	100 µF 10V
C5	ECEA0JS470	Electrolytic	47 µF 6.3V
C6	ECEA1CU101	Electrolytic	100 µF 16V
SW1-10	YWSKHHPR906	Push Switch	
CN1-JM	EMCS0850ZL	8 pin Jack Male	
CN2-JM	EMCS0750ZL	7 pin Jack Male	

POWER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB4 (NLA)	o YWJKBMX10E2A	Printed Circuit Board Assy	
IC1 ⚠	YWSI3122V	IC	
IC2 ⚠	YWSI3052V	IC	
D1	YWRB150F	Diode	
D2	YWRBV401	Diode	
C1	ECQU2A103MN	Plastic	0.01 µF 200V
C4	ECES1HU472M	Electrolytic	4700 µF 50V (SU)
C5	ECES1VU682M	Electrolytic	6800 µF 35V
C6	ECEA1VU101	Electrolytic	100 µF 35V
C7	ECEA1CU101	Electrolytic	100 µF 16V
L1	LF4N501	Coil	
F1 ⚠	XBA2C05ET0A	Current Fuse	0.5A 250V
F2 ⚠	XBA2C16ET0A	Current Fuse	1.6A 250V
F3 ⚠	XBA2C25ET0A	Current Fuse	2.5A 250V
F4-8 ⚠	YWSP71AF010	Current Fuse	
CN1-JM	S3PS2T2EF	3 pin Jack Male	
CN2-JM	EMCS0350Z	3 pin Jack Male	
CN3-JM	EMCS0350ZL	3 pin Jack Male	
E1	S-N5057	Fuse Holder	
TP1	YWTM028	Test pin	
M40	YWV7DA0203A4	Heat Sink	

MIC BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB5	o YWJRCMX10E2A	Printed Board	
CN1	YWLJ23083090	9 pin Connector	
CN2	YWLJ23083020	2 pin Connector	

HEAD PHONE BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB6	o YWJRDMX10E2A	Printed Board	
VR1	YWRS302503AC	Variable Resistor	

POSITIONER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB7	o YWJREMX10E2A	Printed Board	
VR1	YWUBJXE104B	Variable Resistor	100K ohms

SYNC BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB8 (NLA)	o YWJKZMX10E1A	Printed Circuit Board Assy	
IC1	MN74HC4053S	IC	
IC2	MN4528BS	IC	
IC3	AN2510S	IC	
IC4	TC5081AP	IC	
IC5	YWM51271FP	IC	
IC6	MN74HC04S	IC	
IC7	NJM3414M	IC	
IC8	MN74HC00S	IC	
IC9	MN676021PPS	IC	
IC10	YWM51271FP	IC	
IC11	MN74HC4053S	IC	
IC12,13	MP7684	IC	
IC14	MN4528BS	IC	
IC15	AN2510S	IC	

REF.NO.	PART NO.	DESCRIPTION
IC16	TC5081AP	IC
IC17	MN74HC04S	IC
IC18	MN74HC00S	IC
IC19	MN74HC08S	IC
IC20	MN676021PPS	IC
IC21	MN74HC04S	IC
IC22	MN74HC393S	IC
IC23	MN4528BS	IC
IC24,25	MN74HC74S	IC
IC26,27	YWM51272FP	IC
IC29-31	MN74HC245S	IC
IC32	MN74HC86S	IC
IC33	AN78L05	IC
IC301	MN51010LVJ	IC
IC302	MN51015LVK	IC
IC303-310	YWM5M4C500L	IC
IC311,312	MN74HC273S	IC
IC313	MN74HC157S	IC
IC314-316	YWPD41102C1S	IC
IC317-320	MN74HC153S	IC
Q1	2SB709-Q	Transistor
Q2	2SD601-RS	Transistor
Q3-5	2SB709-Q	Transistor
Q6-28	2SD601-RS	Transistor
Q29	2SK198-Q	FET
Q30	2SB709-Q	Transistor
Q31	2SD601-RS	Transistor
Q32-34	2SB709-Q	Transistor
Q35	2SC2404-CDTW	Transistor
Q36-45	2SD601-RS	Transistor
Q46,49	2SK198-Q	FET
Q50-57	2SC2404-CDTW	Transistor
Q58	2SB709-Q	Transistor
Q60	2SD601-RS	Transistor
Q61	2SD602-QRS	Transistor
Q65,66	2SD601-RS	Transistor
Q67,68	2SB709-Q	Transistor
Q71,72	2SD601-RS	Transistor
Q73,74	2SB709-Q	Transistor
Q77,78	2SD601-RS	Transistor
Q79	2SA1022-C	Transistor
Q80,81	2SB709-Q	Transistor
Q301,302	2SK198-Q	FET
D1-3	1SV153	Diode
D301,302	1SV153	Diode
R1	YF2116203JT	Carbon 20K ohms 1/16W
R2	YF2116104JT	Carbon 100K ohms 1/16W
R3	YF2116183GT	Carbon 18K ohms 1/16W
R4	YF2116222GT	Carbon 2.2K ohms 1/16W
R5	YF2116332JT	Carbon 3.3K ohms 1/16W
R6	YF2116102GT	Carbon 1K ohms 1/16W
R7	YF2116202JT	Carbon 2K ohms 1/16W
R8	YF2116222GT	Carbon 2.2K ohms 1/16W
R9,10	YF2116102GT	Carbon 1K ohms 1/16W
R11	YF2116332JT	Carbon 3.3K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION
R12	YF2116102GT	Carbon 1K ohms 1/16W
R13	YF2116222GT	Carbon 2.2K ohms 1/16W
R14	YF2116223JT	Carbon 22K ohms 1/16W
R15	YF2116102GT	Carbon 1K ohms 1/16W
R16	YF2116105GT	Carbon 1M ohms 1/16W
R17	YW2116620JT	Carbon 62 ohms 1/16W
R18	YF2116101JT	Carbon 100 ohms 1/16W
R19	YF2116393GT	Carbon 39K ohms 1/16W
R20	YF2116221JT	Carbon 220 ohms 1/16W
R21	YF2116473GT	Carbon 47K ohms 1/16W
R22	YF2116392JT	Carbon 3.9K ohms 1/16W
R23	YF2116131JT	Carbon 130 ohms 1/16W
R24	YF2116201JT	Carbon 200 ohms 1/16W
R25	YF2116102GT	Carbon 1K ohms 1/16W
R26	YF2116131JT	Carbon 130 ohms 1/16W
R27	YF2116163JT	Carbon 16K ohms 1/16W
R28	YF2116362JT	Carbon 3.6K ohms 1/16W
R29	YF2116102GT	Carbon 1K ohms 1/16W
R30,31	YF2116332JT	Carbon 3.3K ohms 1/16W
R32	YF2116102GT	Carbon 1K ohms 1/16W
R33	YF2116392JT	Carbon 3.9K ohms 1/16W
R34	YF2116131JT	Carbon 130 ohms 1/16W
R35	YF2116201JT	Carbon 200 ohms 1/16W
R36	YF2116102GT	Carbon 1K ohms 1/16W
R37	YF2116131JT	Carbon 130 ohms 1/16W
R38	YF2116163JT	Carbon 16K ohms 1/16W
R39	YF2116362JT	Carbon 3.6K ohms 1/16W
R40	YF2116102GT	Carbon 1K ohms 1/16W
R41,42	YF2116332JT	Carbon 3.3K ohms 1/16W
R43	YF2116103JT	Carbon 10K ohms 1/16W
R44	YF2116102GT	Carbon 1K ohms 1/16W
R45	YF2116392JT	Carbon 3.9K ohms 1/16W
R46	YF2116271JT	Carbon 270 ohms 1/16W
R47	YF2116102GT	Carbon 1K ohms 1/16W
R48	YF2116271JT	Carbon 270 ohms 1/16W
R49	YF2116362JT	Carbon 3.6K ohms 1/16W
R50	YF2116122JT	Carbon 1.2K ohms 1/16W
R51	YF2116102GT	Carbon 1K ohms 1/16W
R52,53	YF2116242GT	Carbon 2.4K ohms 1/16W
R54	YF2116103JT	Carbon 10K ohms 1/16W
R55	YF2116102GT	Carbon 1K ohms 1/16W
R56	R1220P681D	Metal 680 ohms
R57,58	YWR1220P241D	Metal 240 ohms
R59	R1220P681D	Metal 680 ohms
R60	R1220P431D	Metal 430 ohms
R61	R1220P271D	Metal 270 ohms
R62	YWR1220P561D	Metal 560 ohms
R63	R1220P821D	Metal 820 ohms
R64	YWR1220P202D	Metal 2K ohms
R65	YFR1220P222D	Metal 2.2K ohms
R66	YF2116102GT	Carbon 1K ohms 1/16W
R67	YF2116103JT	Carbon 10K ohms 1/16W
R68	YF2116242GT	Carbon 2.4K ohms 1/16W
R69	YF2116154JT	Carbon 150K ohms 1/16W
R70	YF2116562JT	Carbon 5.6K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R71	YF2116101JT	Carbon	100 ohms 1/16W
R72	YF2116332JT	Carbon	3.3K ohms 1/16W
R73	YF2116182GT	Carbon	1.8K ohms 1/16W
R74	YF2116153JT	Carbon	15K ohms 1/16W
R75	YF2116511JT	Carbon	510 ohms 1/16W
R76	YF2116622JT	Carbon	6.2K ohms 1/16W
R77	YF2116222GT	Carbon	2.2K ohms 1/16W
R78,79	YF2116103JT	Carbon	10K ohms 1/16W
R80	YF2116682JT	Carbon	6.8K ohms 1/16W
R81	YF2116334JT	Carbon	330K 1/16W
R82	YF2116103JT	Carbon	10K ohms 1/16W
R83	YF2116472GT	Carbon	4.7K ohms 1/16W
R84	YF2116682JT	Carbon	6.8K ohms 1/16W
R85	YF2116101JT	Carbon	100 ohms 1/16W
R86	YF2116333GT	Carbon	33K ohms 1/16W
R87	YF2116332JT	Carbon	3.3K ohms 1/16W
R88	YF2116133GT	Carbon	13K ohms 1/16W
R89	YF2116105GT	Carbon	1M ohms 1/16W
R90	YF2116102GT	Carbon	1K ohms 1/16W
R91	YF2116203JT	Carbon	20K ohms 1/16W
R92	YF2116104JT	Carbon	100K ohms 1/16W
R93	YF2116183GT	Carbon	18K ohms 1/16W
R94	YF2116222GT	Carbon	2.2K ohms 1/16W
R95	YF2116332JT	Carbon	3.3K ohms 1/16W
R96	YF2116102GT	Carbon	1K ohms 1/16W
R97	YF2116202JT	Carbon	2K ohms 1/16W
R98	YF2116222GT	Carbon	2.2K ohms 1/16W
R99,100	YF2116102GT	Carbon	1K ohms 1/16W
R101	YF2116332JT	Carbon	3.3K ohms 1/16W
R102	YF2116102GT	Carbon	1K ohms 1/16W
R103	YF2116222GT	Carbon	2.2K ohms 1/16W
R104	YF2116223JT	Carbon	22K ohms 1/16W
R105	YF2116102GT	Carbon	1K ohms 1/16W
R106	YF2116105GT	Carbon	1M ohms 1/16W
R107	YW2116620JT	Carbon	62 ohms 1/16W
R108	YF2116101JT	Carbon	100 ohms 1/16W
R109	YF2116393GT	Carbon	39K ohms 1/16W
R110	YF2116221JT	Carbon	220 ohms 1/16W
R111	YF2116473GT	Carbon	47K ohms 1/16W
R112	YF2116105GT	Carbon	1M ohms 1/16W
R113	YF2116102GT	Carbon	1K ohms 1/16W
R114	YF2116331JT	Carbon	330 ohms 1/16W
R115	YF2116682JT	Carbon	6.8K ohms 1/16W
R116	YF2116221JT	Carbon	220 ohms 1/16W
R117	YF2116391JT	Carbon	390 ohms 1/16W
R118	YF2116102GT	Carbon	1K ohms 1/16W
R119	YF2116221JT	Carbon	220 ohms 1/16W
R120	YF2116163JT	Carbon	16K ohms 1/16W
R121	YF2116362JT	Carbon	3.6K ohms 1/16W
R122	YF2116102GT	Carbon	1K ohms 1/16W
R123	YF2116332JT	Carbon	3.3K ohms 1/16W
R124	YF2116682JT	Carbon	6.8K ohms 1/16W
R125	YF2116221JT	Carbon	220 ohms 1/16W
R127	YF2116102GT	Carbon	1K ohms 1/16W
R128	YF2116221JT	Carbon	220 ohms 1/16W
R129	YF2116163JT	Carbon	16K ohms 1/16W
R130	YF2116362JT	Carbon	3.6K ohms 1/16W
R131	YF2116102GT	Carbon	1K ohms 1/16W
R132	YF2116332JT	Carbon	3.3K ohms 1/16W
R133	YF2116392JT	Carbon	3.9K ohms 1/16W
R134	YF2116271JT	Carbon	270 ohms 1/16W
R135,136	YF2116102GT	Carbon	1K ohms 1/16W
R137	YF2116271JT	Carbon	270 ohms 1/16W
R138	YF2116362JT	Carbon	3.6K ohms 1/16W
R139	YF2116122JT	Carbon	1.2K ohms 1/16W
R140	YF2116332JT	Carbon	3.3K ohms 1/16W
R141	YF2116154JT	Carbon	150K ohms 1/16W
R142	YF2116222GT	Carbon	2.2K ohms 1/16W
R143	YF2116101JT	Carbon	100 ohms 1/16W
R144	YF2116332JT	Carbon	3.3K ohms 1/16W
R145	YF2116182GT	Carbon	1.8K ohms 1/16W
R146	YF2116511JT	Carbon	510 ohms 1/16W
R147	YF2116153JT	Carbon	15K ohms 1/16W
R148	YF2116622JT	Carbon	6.2K ohms 1/16W
R149,150	YF2116222GT	Carbon	2.2K ohms 1/16W
R151,152	YF2116103JT	Carbon	10K ohms 1/16W
R153	YF2116682JT	Carbon	6.8K ohms 1/16W
R154	YF2116334JT	Carbon	330K ohms1/16W
R155	YF2116103JT	Carbon	10K ohms 1/16W
R156	YF2116472GT	Carbon	4.7K ohms 1/16W
R157	YF2116682JT	Carbon	6.8K ohms 1/16W
R158	YF2116101JT	Carbon	100 ohms 1/16W
R159	YF2116333GT	Carbon	33K ohms 1/16W
R160	YF2116332JT	Carbon	3.3K ohms 1/16W
R161	YF2116133GT	Carbon	13K ohms 1/16W
R162	YF2116105GT	Carbon	1M ohms 1/16W
R163	YF2116102GT	Carbon	1K ohms 1/16W
R164	YF2116224JT	Carbon	220K ohms 1/16W
R165	YF2116102GT	Carbon	1K ohms 1/16W
R168	YF2116512JT	Carbon	5.1K ohms 1/16W
R169	YF2116162JT	Carbon	1.6K ohms 1/16W
R170	YF2116101JT	Carbon	100 ohms 1/16W
R171	YF2116153JT	Carbon	15K ohms 1/16W
R172	YF2116302GT	Carbon	3K ohms 1/16W
R173	YF2116102GT	Carbon	1K ohms 1/16W
R174	YF2116153JT	Carbon	15K ohms 1/16W
R175	YF2116392JT	Carbon	3.9K ohms 1/16W
R176	YF2116102GT	Carbon	1K ohms 1/16W
R177	YF2116222GT	Carbon	2.2K ohms 1/16W
R178	YF2116202JT	Carbon	2K ohms 1/16W
R179	YF2116332JT	Carbon	3.3K ohms 1/16W
R181	YF2116102GT	Carbon	1K ohms 1/16W
R182	YF2116682JT	Carbon	6.8K ohms 1/16W
R183	YF2116132JT	Carbon	1.3K ohms 1/16W
R184-186	YF2116102GT	Carbon	1K ohms 1/16W
R187,189	YF2116332JT	Carbon	3.3K ohms 1/16W
R190	YF2116243JT	Carbon	24K ohms 1/16WF
R191	YF2116153JT	Carbon	15K ohms 1/16W
R192	YF2116243JT	Carbon	24K ohms 1/16WF
R193	YF2116153JT	Carbon	15K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R194	YF2116243JT	Carbon	24K ohms 1/16WF
R195	YF2116153JT	Carbon	15K ohms 1/16W
R196	YF2116822JT	Carbon	8.2K ohms 1/16W
R197	YF2116332JT	Carbon	3.3K ohms 1/16W
R198	YF2116472GT	Carbon	4.7K ohms 1/16W
R199	YF2116511JT	Carbon	510 ohms 1/16W
R200	YF2116113JT	Carbon	11K ohms 1/16W
R201	YF2116392JT	Carbon	3.9K ohms 1/16W
R202	YF2116621JT	Carbon	620 ohms 1/16W
R203	YF2116332JT	Carbon	3.3K ohms 1/16W
R204	YF2116621JT	Carbon	620 ohms 1/16W
R205	YF2116202JT	Carbon	2K ohms 1/16W
R206	YF2116391JT	Carbon	390 ohms 1/16W
R207	YF2116102GT	Carbon	1K ohms 1/16W
R208	YF2116821GT	Carbon	820 ohms 1/16W
R209,210	YF2116511JT	Carbon	510 ohms 1/16W
R211	YF2116332JT	Carbon	3.3K ohms 1/16W
R212	YF2116392JT	Carbon	3.9K ohms 1/16W
R213	YF2116562JT	Carbon	5.6K ohms 1/16W
R214,215	YF2116332JT	Carbon	3.3K ohms 1/16W
R217	YF2116151JT	Carbon	150 ohms 1/16W
R218	YF2116272JT	Carbon	2.7K ohms 1/16W
R219	YF2116680JT	Carbon	68 ohms 1/16W
R220	YF2116332JT	Carbon	3.3K ohms 1/16W
R221	YF2116243JT	Carbon	24K ohms 1/16WF
R222	YF2116153JT	Carbon	15K ohms 1/16W
R223	YF2116243JT	Carbon	24K ohms 1/16WF
R224	YF2116153JT	Carbon	15K ohms 1/16W
R225	YF2116243JT	Carbon	24K ohms 1/16WF
R226	YF2116153JT	Carbon	15K ohms 1/16W
R227	YF2116822JT	Carbon	8.2K ohms 1/16W
R228	YF2116332JT	Carbon	3.3K ohms 1/16W
R229	YF2116472GT	Carbon	4.7K ohms 1/16W
R230	YF2116511JT	Carbon	510 ohms 1/16W
R231	YF2116113JT	Carbon	11K ohms 1/16W
R232	YF2116392JT	Carbon	3.9K ohms 1/16W
R233	YF2116621JT	Carbon	620 ohms 1/16W
R234	YF2116332JT	Carbon	3.3K ohms 1/16W
R235	YF2116621JT	Carbon	620 ohms 1/16W
R236	YF2116202JT	Carbon	2K ohms 1/16W
R237	YF2116391JT	Carbon	390 ohms 1/16W
R238	YF2116102GT	Carbon	1K ohms 1/16W
R239	YF2116821GT	Carbon	820 ohms 1/16W
R240,241	YF2116511JT	Carbon	510 ohms 1/16W
R242	YF2116332JT	Carbon	3.3K ohms 1/16W
R245	YF2116103JT	Carbon	10K ohms 1/16W
R246	YF2116332JT	Carbon	3.3K ohms 1/16W
R247	YF2116102GT	Carbon	1K ohms 1/16W
R248,249	YF2116332JT	Carbon	3.3K ohms 1/16W
R252	YF2116103JT	Carbon	10K ohms 1/16W
R253	YF2116332JT	Carbon	3.3K ohms 1/16W
R254	YF2116102GT	Carbon	1K ohms 1/16W
R255,256	YF2116332JT	Carbon	3.3K ohms 1/16W
R259	YF2116103JT	Carbon	10K ohms 1/16W
R260	YF2116332JT	Carbon	3.3K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R261	YF2116102GT	Carbon	1K ohms 1/16W
R262,263	YF2116332JT	Carbon	3.3K ohms 1/16W
R264	YF2116102GT	Carbon	1K ohms 1/16W
R265	YF2116681JT	Carbon	680 ohms 1/16W
R266	YF2116102GT	Carbon	1K ohms 1/16W
R267	YF2116222GT	Carbon	2.2K ohms 1/16W
R268	YF2116103JT	Carbon	10K ohms 1/16W
R269-271	YF2116202JT	Carbon	2K ohms 1/16W
R272	YF2116103JT	Carbon	10K ohms 1/16W
R273	YF2116125JT	Carbon	1.2M ohms 1/16W
R274,275	YF2116203JT	Carbon	20K ohms 1/16W
R276	YF2116125JT	Carbon	1.2M ohms 1/16W
R277,278	YF2116203JT	Carbon	20K ohms 1/16W
R279,280	YF2116102GT	Carbon	1K ohms 1/16W
R281	YF2116392JT	Carbon	3.9K ohms 1/16W
R282	YF2116103JT	Carbon	10K ohms 1/16W
R283	YF2116102GT	Carbon	1K ohms 1/16W
R284,286	ERSA33J102	Carbon	1K ohms
R287	YF2116511JT	Carbon	510 ohms 1/16W
R301	YF2116332JT	Carbon	3.3K ohms 1/16W
R302	YF2116333GT	Carbon	33K ohms 1/16W
R303	YF2116101JT	Carbon	100 ohms 1/16W
R304	YF2116752JT	Carbon	7.5K ohms 1/16W
R307	YF2116103JT	Carbon	10K ohms 1/16W
R308	YF2116101JT	Carbon	100 ohms 1/16W
R311	YF2116332JT	Carbon	3.3K ohms 1/16W
R312	YF2116333GT	Carbon	33K ohms 1/16W
R313	YF2116101JT	Carbon	100 ohms 1/16W
R314	YF2116752JT	Carbon	7.5K ohms 1/16W
R317	YF2116103JT	Carbon	10K ohms 1/16W
R318	YF2116101JT	Carbon	100 ohms 1/16W
R321	YF2116102GT	Carbon	1K ohms 1/16W
R322-324	YF2116511JT	Carbon	510 ohms 1/16W
R325	YF2116101JT	Carbon	100 ohms 1/16W
R340-393	YF2116101JT	Carbon	100 ohms 1/16W
R400	YF2116102GT	Carbon	1K ohms 1/16W
VR1	EVM13SW00BQ4	Variable Resistor	47K ohms
VR2	EVM13SW00BQ3	Variable Resistor	4.7K ohms
VR3	EVM13SW00B14	Variable Resistor	10K ohms
VR4	EVM13SW00BY2	Variable Resistor	330 ohms
VR5	EVM13SW00BE4	Variable Resistor	22K ohms
VR6	EVM13SW00BY3	Variable Resistor	3.3K ohms
VR7	EVM13SW00BQ4	Variable Resistor	47K ohms
VR8	EVM13SW00BQ3	Variable Resistor	4.7K ohms
VR9	EVM13SW00B14	Variable Resistor	10K ohms
VR10	EVM13SW00BY2	Variable Resistor	330 ohms
VR11	EVM13SW00BE4	Variable Resistor	22K ohms
VR12	EVM13SW00BY3	Variable Resistor	3.3K ohms
VR13-15	EVM13SW00B14	Variable Resistor	10K ohms
VR16	EVM13SW00B23	Variable Resistor	2K ohms
VR17-21	EVM13SW00B14	Variable Resistor	10K ohms
VR22	EVM13SW00B23	Variable Resistor	2K ohms
VR23	EVM13SW00B14	Variable Resistor	10K ohms
VR24-26	EVM13SW00B13	Variable Resistor	1K ohms
VR30	EVM13SW00B14	Variable Resistor	10K ohms

REF.NO.	PART NO.	DESCRIPTION	
VR31,32	EVM13SW00BE2	Variable Resistor	2.2K ohms
VR33	EVM13SW00BQ2	Variable Resistor	470 ohms
VR34	EVM13SW00BS2	Variable Resistor	680 ohms
Z1-3	YWRKM10L152F	Block Resistor	
C1	ECEA1AS470	Electrolytic	47 µF 10V
C2	ECEA1CKS470	Electrolytic	47 µF 16V
C3	YF400331SLKT	Ceramic	330 pF
C4	YF400102XMT	Ceramic	1000 pF
C5,6	YWT316B104MT	Ceramic	0.1 µF
C7	YF400222XKT	Ceramic	2200 pF
C8	ECEA1HKS010	Electrolytic	1 µF 50V
C9	ECEA1AS470	Electrolytic	47 µF 10V
C10	YWT316B104MT	Ceramic	0.1 µF
C11	ECEA1HKS010	Electrolytic	1 µF 50V
C12,13	YWT316B104MT	Ceramic	0.1 µF
C14	YF400561SLKT	Ceramic	560 pF
C15	YF400102XMT	Ceramic	1000 pF
C16	YWT316B104MT	Ceramic	0.1 µF
C17	ECEA1AS470	Electrolytic	47 µF 10V
C18	YF400102XMT	Ceramic	1000 pF
C19,20	YF400473FZT	Ceramic	0.047 µF
C21	ECEA0JK220	Electrolytic	22 µF 6.3V
C22	ECEA1HKSR47	Electrolytic	0.47 µF 50V (KS)
C23	ECEA0JK220	Electrolytic	22 µF 6.3V
C24	ECEA1AS470	Electrolytic	47 µF 10V
C25	ECEA0JS470	Electrolytic	47 µF 6.3V
C26	ECEA1CKS470	Electrolytic	47 µF 16V
C27	YWT316B104MT	Ceramic	0.1 µF
C28	ECEA0JS470	Electrolytic	47 µF 6.3V
C29	YWT316B104MT	Ceramic	0.1 µF
C30	ECEA0JS470	Electrolytic	47 µF 6.3V
C31	ECEA1AS470	Electrolytic	47 µF 10V
C32	ECEA0JS470	Electrolytic	47 µF 6.3V
C33	ECEA1CKS470	Electrolytic	47 µF 16V
C34	YWT316B104MT	Ceramic	0.1 µF
C35	ECEA0JS470	Electrolytic	47 µF 6.3V
C36,37	YWT316B104MT	Ceramic	0.1 µF
C38	ECEA1AS470	Electrolytic	47 µF 10V
C39	ECEA0JS470	Electrolytic	47 µF 6.3V
C40	ECEA1CKS470	Electrolytic	47 µF 16V
C41	ECEA1HKS3R3	Electrolytic	3.3 µF 50V (KS)
C42	ECEA0JS470	Electrolytic	47 µF 6.3V
C43,44	YWT316B104MT	Ceramic	0.1 µF
C45	ECSF1AE226	Electrolytic	22 µF 10V
C46	YWT316B104MT	Ceramic	0.1 µF
C47	ECEA1AKS330	Electrolytic	33 µF 10V
C48	YWT316B104MT	Ceramic	0.1 µF
C49	ECEA1AKS330	Electrolytic	33 µF 10V
C50-52	YWT316B104MT	Ceramic	0.1 µF
C53	ECEA1AKS330	Electrolytic	33 µF 10V
C54,55	YWT316B104MT	Ceramic	0.1 µF
C56	ECSF1AE226	Electrolytic	22 µF 10V
C57	YWT316B104MT	Ceramic	0.1 µF
C58	ECEA1AKS330	Electrolytic	33 µF 10V
C59	YWT316B104MT	Ceramic	0.1 µF
C60	ECEA1AKS330	Electrolytic	33 µF 10V
C61-63	YWT316B104MT	Ceramic	0.1 µF
C64	ECEA1AKS330	Electrolytic	33 µF 10V
C65	ECEA1AS470	Electrolytic	47 µF 10V
C66	ECEA1CKS470	Electrolytic	47 µF 16V
C67	YF400471SLKT	Ceramic	470P
C68	YF400271SLKT	Ceramic	270 pF
C69	ECEA1AS470	Electrolytic	47 µF 10V
C70	YWT316B104MT	Ceramic	0.1 µF
C71	ECEA0JKS330	Electrolytic	33 µF 6.3V
C72	ECEA1AS470	Electrolytic	47 µF 10V
C73	ECEA1HSNR22	Electrolytic	0.22 µF 50V
C74	YF400152XKT	Ceramic	1500 pF
C75	ECEA1HKS010	Electrolytic	1 µF 50V
C76	YF400152XKT	Ceramic	1500 pF
C77	YF400182XKT	Ceramic	1800 pF
C78	YF400390SLKT	Ceramic	39 pF
C79-81	YF400472XMT	Ceramic	4700 pF
C82	YWT316B104MT	Ceramic	0.1 µF
C83	ECEA1AS470	Electrolytic	47 µF 10V
C84	ECEA1HKS2R2	Electrolytic	2.2 µF 50V
C85	YF400822XKT	Ceramic	8200 pF
C86	YF400330CHJT	Ceramic	33 pF
C87	YF400150CHJT	Ceramic	15 pF
C88	YWT316B104MT	Ceramic	0.1 µF
C89	ECEA1AS470	Electrolytic	47 µF 10V
C90	ECEA1EK100	Electrolytic	10 µF 10V
C91,92	YWT316B104MT	Ceramic	0.1 µF
C93	ECEA1EK100	Electrolytic	10 µF 10V
C94	ECEA1AS470	Electrolytic	47 µF 10V
C95	YF400390SLKT	Ceramic	39 pF
C96	ECEA1CKS470	Electrolytic	47 µF 16V
C97	YF400331SLKT	Ceramic	330 pF
C98	YF400102XMT	Ceramic	1000 pF
C99,100	YWT316B104MT	Ceramic	0.1 µF
C101	YF400222XKT	Ceramic	2200 pF
C102	ECEA1HKS010	Electrolytic	1 µF 50V
C103	YWT316B104MT	Ceramic	0.1 µF
C104	ECEA1AS470	Electrolytic	47 µF 10V
C105	YWT316B104MT	Ceramic	0.1 µF
C106	ECEA1HKS010	Electrolytic	1 µF 50V
C107	YWT316B104MT	Ceramic	0.1 µF
C108	YF400561SLKT	Ceramic	560 pF
C109	YF400102XMT	Ceramic	1000 pF
C110	YWT316B104MT	Ceramic	0.1 µF
C111	ECEA1AS470	Electrolytic	47 µF 10V
C112	YF400102XMT	Ceramic	1000 pF
C113,114	YF400473FZT	Ceramic	0.047 µF
C115	ECEA0JK220	Electrolytic	22 µF 6.3V
C116	ECEA1HKSR47	Electrolytic	0.47 µF 50V (KS)
C117	ECEA0JK220	Electrolytic	22 µF 6.3V
C118	ECEA1AS470	Electrolytic	47 µF 10V
C119	YWT316B104MT	Ceramic	0.1 µF

REF.NO.	PART NO.	DESCRIPTION	
C120	YF400103XMT	Ceramic	0.01 µF
C121	ECEA1AS470	Electrolytic	47 µF 10V
C122	ECEA1CKS470	Electrolytic	47 µF 16V
C123	ECEA0JS470	Electrolytic	47 µF 6.3V
C124	ECEA1AS470	Electrolytic	47 µF 10V
C125	ECEA1CKS470	Electrolytic	47 µF 16V
C126	ECEA0JS470	Electrolytic	47 µF 6.3V
C127	ECEA1AS470	Electrolytic	47 µF 10V
C128	ECEA1CKS470	Electrolytic	47 µF 16V
C129	ECEA0JS470	Electrolytic	47 µF 6.3V
C130	YF400471SLKT	Ceramic	470 pF
C131	YF400271SLKT	Ceramic	270 pF
C132	ECEA1AS470	Electrolytic	47 µF 10V
C133	YWT316B104MT	Ceramic	0.1 µF
C134	ECEA1AKS330	Electrolytic	33 µF 10V
C135	ECEA1AS470	Electrolytic	47 µF 10V
C136	ECEA1HSNR22	Electrolytic	0.22 µF 50V
C137	YF400152XKT	Ceramic	1500 pF
C138	ECEA1HKS010	Electrolytic	1 µF 50V
C139	YF400152XKT	Ceramic	1500 pF
C140	YF400182XKT	Ceramic	1800 pF
C141	ECEA1EK100	Electrolytic	10 µF 10V
C142	YF400472XMT	Ceramic	4700 pF
C143	ECEA1HKS010	Electrolytic	1 µF 50V
C144,145	YF400472XMT	Ceramic	4700 pF
C146	ECEA1HKS2R2	Electrolytic	2.2 µF 50V
C147	YF400822XKT	Ceramic	8200 pF
C148	YF400330CHJT	Ceramic	33 pF
C149	YF400150CHJT	Ceramic	15 pF
C150	YWT316B104MT	Ceramic	0.1 µF
C151	ECEA1AS470	Electrolytic	47 µF 10V
C152	YF400473FZT	Ceramic	0.047 µF
C153	YF400331CHJT	Ceramic	330 pF
C154	YWT316B104MT	Ceramic	0.1 µF
C155	ECEA1AS470	Electrolytic	47 µF 10V
C156	ECEA1EK100	Electrolytic	10 µF 10V
C157,158	YWT316B104MT	Ceramic	0.1 µF
C159	ECEA1AS470	Electrolytic	47 µF 10V
C160	400080CHDT	Ceramic	8 pF
C161,162	YF400103XMT	Ceramic	0.01 µF
C163	YF400330CHJT	Ceramic	33 pF
C164	YF400150CHJT	Ceramic	15 pF
C165	YF400822XKT	Ceramic	8200 pF
C166	ECEA1HKS2R2	Electrolytic	2.2 µF 50V
C167	ECEA1AS470	Electrolytic	47 µF 10V
C168	YWT316B104MT	Ceramic	0.1 µF
C169	ECEA1EK100	Electrolytic	10 µF 10V
C170	YWT316B104MT	Ceramic	0.1 µF
C171	YF400390SLKT	Ceramic	39 pF
C172	YWT316B104MT	Ceramic	0.1 µF
C173	YF400473FZT	Ceramic	0.047 µF
C174	ECEA1EK100	Electrolytic	10 µF 10V
C175-177	YF400103XMT	Ceramic	0.01 µF
C178	ECEA0JK220	Electrolytic	22 µF 6.3V
C179	ECEA1HKS010	Electrolytic	1 µF 50V

REF.NO.	PART NO.	DESCRIPTION	
C180	YF400473FZT	Ceramic	0.047 µF
C181	YF400103XMT	Ceramic	0.01 µF
C182	ECEA1HKS010	Electrolytic	1 µF 50V
C183	YWT316B104MT	Ceramic	0.1 µF
C184,185	ECEA0JK220	Electrolytic	22 µF 6.3V
C186	ECEA0JS470	Electrolytic	47 µF 6.3V
C187	YF400151CHJT	Ceramic	150 PF
C188,189	YF400103XMT	Ceramic	0.01 µF
C190	ECEA1EK100	Electrolytic	10µF 10V
C191	YF400473FZT	Ceramic	0.047 µF
C192,193	YWT316B104MT	Ceramic	0.1 µF
C194	YF400473FZT	Ceramic	0.047 µF
C195	ECEA1EK100	Electrolytic	10µF 10V
C196,197	YF400103XMT	Ceramic	0.01 µF
C198	ECEA0JK220	Electrolytic	22µF 6.3V
C199	YF400103XMT	Ceramic	0.01 µF
C200	ECEA1HKS010	Electrolytic	1 µF 50V
C201	YF400473FZT	Ceramic	0.047 µF
C202	YF400103XMT	Ceramic	0.01 µF
C203	ECEA1HKS010	Electrolytic	1 µF 50V
C204	ECEA0JK220	Electrolytic	22µF 6.3V
C205	YWT316B104MT	Ceramic	0.1 µF
C206	ECEA0JK220	Electrolytic	22µF 6.3V
C207	ECEA0JS470	Electrolytic	47µF 6.3V
C208	YF400151CHJT	Ceramic	150 pF
C209,210	YF400103XMT	Ceramic	0.01 µF
C211	ECEA1EK100	Electrolytic	10µF 10V
C212	YF400473FZT	Ceramic	0.047 µF
C213	YWT316B104MT	Ceramic	0.1 µF
C217	ECEA1CU471	Electrolytic	470 µF 16V
C221	ECEA0JS470	Electrolytic	47µF 6.3V
C222	ECEA1HKS3R3	Electrolytic	3.3 µF 50V (KS)
C223	ECEA1CKS470	Electrolytic	47µF 16V
C226	ECEA0JS470	Electrolytic	47µF 6.3V
C227	ECEA1HKS3R3	Electrolytic	3.3 µF 50V (KS)
C228	ECEA1CKS470	Electrolytic	47µF 16V
C231	ECEA0JS470	Electrolytic	47µF 6.3V
C232	ECEA1HKS3R3	Electrolytic	3.3 µF 50V (KS)
C233	ECEA1CKS470	Electrolytic	47µF 16V
C234	ECEA0JS470	Electrolytic	47µF 6.3V
C235-239	YF400390SLKT	Ceramic	39P
C240	ECEA1HKS010	Electrolytic	1 µF 50V
C241	YF400220SLKT	Ceramic	22pF
C242	YF400390SLKT	Ceramic	39pF
C243	YF400220SLKT	Ceramic	22pF
C247	ECSF1AE106	Tantalum	10µF 10V
C248	YWT316B104MT	Ceramic	0.1 µF
C249	YF400222XKT	Ceramic	2200 pF
C250,251	YF400820CHJT	Ceramic	82pF
C252,253	YF400390SLKT	Ceramic	39pF
C254	YF400200CHJT	Ceramic	20pF
C255	YF400470CHJT	Ceramic	47pF
C256	YF400681XKT	Ceramic	680 µF 50V
C257-259	YF400470CHJT	Ceramic	47pF
C260-263	YWT316B104MT	Ceramic	0.1 µF
C265,266	YF400101SLKT	Ceramic	100 pF

REF.NO.	PART NO.	DESCRIPTION	
C267,268	YF400100CHJT	Ceramic	10 pF
C269	YF400330CHJT	Ceramic	33 pF
C301	YF400822XKT	Ceramic	8200 pF
C302	ECEA1HKS2R2	Electrolytic	2.2 µF 50V
C303	YF400330CHJT	Ceramic	33 pF
C304	YF400100CHDT	Ceramic	10 pF
C305	ECSF1AE106	Tantalum	10 µF 10V
C306,307	YWT316B104MT	Ceramic	0.1 µF
C308	YF400822XKT	Ceramic	8200 pF
C309	ECEA1HKS2R2	Electrolytic	2.2 µF 50V
C310	YF400330CHJT	Ceramic	33 pF
C311	YF400100CHDT	Ceramic	10 pF
C312	ECSF1AE106	Tantalum	10 µF 10V
C313	ECSF1AE335	Tantalum	3.3 µF 10V
C314	YWT316B104MT	Ceramic	0.1 µF
C315-318	ECSF1AE335	Tantalum	3.3 µF 10V
C319	YWT316B104MT	Ceramic	0.1 µF
C320	ECSF1AE335	Tantalum	3.3 µF 10V
C321	YWT316B104MT	Ceramic	0.1 µF
C322-324	ECSF1AE335		3.3 µF 10V
C325-328	YWT316B104MT	Ceramic	0.1 µF
C329,330	ECSF1AE106	Tantalum	10 µF 10V
C331	ECSF1AE335	Tantalum	3.3 µF 10V
C332-334	YF400150CHJT	Ceramic	15 pF
C335	YF400201CHJT	Ceramic	200 pF
C336-341	YWT316B104MT	Ceramic	0.1 µF
C342	YF400100CHDT	Ceramic	10 pF
CT1-4	YFTZ03R300FR	Trimmer Capacitor	30 pF
L1	F051067	Coil	
L2-5	YFF3216E8R2K	Coil	8.2 µH
L6	F051067	Coil	
L7,8	YFF3216E8R2K	Coil	8.2 µH
L9,10	YFF3216A1R0K	Coil	1 µH
L11-13	YFF3216A2R2K	Coil	2.2 µH
L14	YFF3216E8R2K	Coil	8.2 µH
L15	F051067	Coil	
L16	YFF3216A2R2K	Coil	2.2 µH
L17	YFF3216A1R0K	Coil	1 µH
L18	YWLAL2KR8R2K	Coil	8.2 µH
L19	YFF3216A1R0K	Coil	1 µH
L20	YWLAL2KR8R2K	Coil	8.2 µH
L21,22	YWLAL2KR560K	Coil	56 µH
L23,24	YFF3216A1R0K	Coil	1 µH
L25-30	YFF3216A2R2K	Coil	2.2 µH
L31	YFF3216E8R2K	Coil	8.2 µH
L32	YWLAL2KR8R2K	Coil	8.2 µH
L301	YWLAL4SK8R2K	Coil	8.2 µH
L302	YFF3216E8R2K	Coil	8.2 µH
L303	YWS5LE0381	Coil	380 µH
L304,305	YFF3216A1R0K	Coil	1 µH
L306	YFF3216E8R2K	Coil	8.2 µH
L307	NL32T2R2K	Coil	2.2 µH
L308	YFF3216E8R2K	Coil	8.2 µH
L309	YWS5LE0381	Coil	380 µH
L310	YFF3216A1R0K	Coil	1 µH

REF.NO.	PART NO.	DESCRIPTION
X1-3	YFMS30917M10	Crystal Oscillator
CF1	YWYS30383	Filter
CF2	YWYS30389	Filter
CF3,4	YWYS30384	Filter
CF5	YWYS30387	Filter
CF6	YWYS30383	Filter
CF7	YWYS30389	Filter
CF8,9	YWYS30384	Filter
CF10	YWYS30387	Filter
CF11,12	YWYS30386	Filter
J285,305	YF21160R00T	Jamper Resister
J306,309	YF21160R00T	Jamper Resister
J315,316	YF21160R00T	Jamper Resister
J320	YF21160R00T	Jamper Resister
CN1-JM	EMCS0250ZL	2 pin Jack Male
CN2-JM	EMCS0350ZL	3 pin Jack Male
CN3-JM	EMCS0450ZL	4 pin Jack Male
CN4-JM	EMCS1150ZL	11 pin Jack Male
CN5-JM	EMCS0250ZL	2 pin Jack Male
CN6-JM	EMCS0450ZL	4 pin Jack Male
CN7-JM	EMCS0250ZL	2 pin Jack Male
CN8-JM	EMCS0650ZL	6 pin Jack Male
CN9-JM	EMCS0550ZL	5 pin Jack Male
M41	o YWV2HA0559A3	Upper Shield Cover
M42	o YWV2HA0560A3	Bottom Shield Cover

MIXER BOARD

PCB9 (NLA)	o YWJKZMX10E2A	Printed Circuit Board Assy
IC1	NJM3414M	IC
IC2	MN74HC00S	IC
IC3,4	YWSC49069F	IC
IC5	MN74HC4053S	IC
IC6	YWSC49069F	IC
IC7,8	NJM319M	IC
IC9	YWSC49069F	IC
IC10	AN6914S	IC
IC11	YWSC49069F	IC
IC12	AN6914S	IC
IC14	YWM51304L	IC
IC15	NJM4559M	IC
IC18	YWM5216FP	IC
IC20	AN78L09	IC
IC21	NJM4559M	IC
IC22	YWM51523AL	IC
IC23	YWPD41102C1S	IC
IC24	YWPD65005232	IC
IC25	MN74HC86S	IC
IC26	MN74HC00S	IC
Q1,2	2SD601-RS	Transistor
Q3	2SA1022-C	Transistor
Q4	2SD601-RS	Transistor
Q5	2SB709-Q	Transistor

REF.NO.	PART NO.	DESCRIPTION	
Q6	2SD601-RS	Transistor	
Q7	2SB709-Q	Transistor	
Q8	2SD601-RS	Transistor	
Q9	2SC2404-CDTW	Transistor	
Q10,11	2SD601-RS	Transistor	
Q12	2SA1022-C	Transistor	
Q13	2SD601-RS	Transistor	
Q14	2SB709-Q	Transistor	
Q15-19	2SD601-RS	Transistor	
Q20	2SA1022-C	Transistor	
Q21,22	2SD601-RS	Transistor	
Q23	2SA1022-C	Transistor	
Q24	2SD601-RS	Transistor	
Q25	2SA1022-C	Transistor	
Q26,27	2SD601-RS	Transistor	
Q28	2SB709-Q	Transistor	
Q29	2SA1022-C	Transistor	
Q30	2SB709-Q	Transistor	
Q31,32	2SD601-RS	Transistor	
Q33	2SB709-Q	Transistor	
Q34	2SA1022-C	Transistor	
Q35	2SB709-Q	Transistor	
Q36,37	2SD601-RS	Transistor	
Q38-44	2SB709-Q	Transistor	
Q45-48	2SD601-RS	Transistor	
Q201,202	2SD601-RS	Transistor	
Q203,204	2SB709-Q	Transistor	
D1	MA151K	Diode	
R1	YF2116332JT	Carbon	3.3K ohms 1/16W
R2	YF2116182GT	Carbon	1.8K ohms 1/16W
R3	YF2116222GT	Carbon	2.2K ohms 1/16W
R4	YF2116103JT	Carbon	10K ohms 1/16W
R5	YF2116222GT	Carbon	2.2K ohms 1/16W
R6,7	YF2116102GT	Carbon	1K ohms 1/16W
R8	YF2116222GT	Carbon	2.2K ohms 1/16W
R9,10	YF2116102GT	Carbon	1K ohms 1/16W
R11	YF2116222GT	Carbon	2.2K ohms 1/16W
R12	YF2116680JT	Carbon	68 ohms 1/16W
R13	YF2116242GT	Carbon	2.4K ohms 1/16W
R14	YF2116132JT	Carbon	1.3K ohms 1/16W
R15	YF2116242GT	Carbon	2.4K ohms 1/16W
R16	YF2116272JT	Carbon	2.7K ohms 1/16W
R17,18	YF2116153JT	Carbon	15K ohms 1/16W
R19	YF2116512JT	Carbon	5.1K ohms 1/16W
R20	YF2116272JT	Carbon	2.7K ohms 1/16W
R21	YF2116103JT	Carbon	10K ohms 1/16W
R22	YF2116512JT	Carbon	5.1K ohms 1/16W
R23	YF2116102GT	Carbon	1K ohms 1/16W
R24	YF2116222GT	Carbon	2.2K ohms 1/16W
R25,26	YF2116102GT	Carbon	1K ohms 1/16W
R27	YF2116203JT	Carbon	20K ohms 1/16W
R28	YF2116302GT	Carbon	3K ohms 1/16W
R29,30	YF2116102GT	Carbon	1K ohms 1/16W
R31,32	YF2116104JT	Carbon	100K ohms 1/16W
R33,34	YF2116102GT	Carbon	1K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R35,36	YF2116754JT	Carbon	750K ohms 1/16W
R37-39	YF2116332JT	Carbon	3.3K ohms 1/16W
R40	YF2116103JT	Carbon	10K ohms 1/16W
R41	YF2116332JT	Carbon	3.3K ohms 1/16W
R42	YF2116103JT	Carbon	10K ohms 1/16W
R43	YF2116332JT	Carbon	3.3K ohms 1/16W
R44	YF2116222GT	Carbon	2.2K ohms 1/16W
R45	YF2116103JT	Carbon	10K ohms 1/16W
R46	YF2116222GT	Carbon	2.2K ohms 1/16W
R47,48	YF2116511JT	Carbon	510 ohms 1/16W
R49	YF2116512JT	Carbon	5.1K ohms 1/16W
R50	YF2116103JT	Carbon	10K ohms 1/16W
R51	YF2116222GT	Carbon	2.2K ohms 1/16W
R52,53	YF2116511JT	Carbon	510 ohms 1/16W
R54	YF2116222GT	Carbon	2.2K ohms 1/16W
R55	YF2116512JT	Carbon	5.1K ohms 1/16W
R56	YF2116272JT	Carbon	2.7K ohms 1/16W
R57	YF2116100JT	Carbon	10 ohms 1/16W
R58	YF2116152JT	Carbon	1.5K ohms 1/16W
R59	YF2116100JT	Carbon	10 ohms 1/16W
R60-62	YF2116680JT	Carbon	68 ohms 1/16W
R63	YF2116202JT	Carbon	2K ohms 1/16W
R64	YF2116151JT	Carbon	150 ohms 1/16W
R65	YF2116103JT	Carbon	10K ohms 1/16W
R66	YF2116151JT	Carbon	150 ohms 1/16W
R67	YF2116391JT	Carbon	390 ohms 1/16W
R68,69	YF2116102GT	Carbon	1K ohms 1/16W
R71	YF2116103JT	Carbon	10K ohms 1/16W
R72,73	YF2116102GT	Carbon	1K ohms 1/16W
R75	YF2116103JT	Carbon	10K ohms 1/16W
R76	YF2116751JT	Carbon	750 ohms 1/16W
R77	YF2116151JT	Carbon	150 ohms 1/16W
R78	YF2116103JT	Carbon	10K ohms 1/16W
R79	YF2116151JT	Carbon	150 ohms 1/16W
R80	YF2116750JT	Carbon	75 ohms 1/16W
R81,82	YF2116102GT	Carbon	1K ohms 1/16W
R84	YF2116103JT	Carbon	10K ohms 1/16W
R85,87	YF2116102GT	Carbon	1K ohms 1/16W
R88	YF2116103JT	Carbon	10K ohms 1/16W
R89	YF2116512JT	Carbon	5.1K ohms 1/16W
R90	YF2116272JT	Carbon	2.7K ohms 1/16W
R91	YF2116100JT	Carbon	10 ohms 1/16W
R92	YF2116152JT	Carbon	1.5K ohms 1/16W
R93	YF2116100JT	Carbon	10 ohms 1/16W
R94-101	YF2116333GT	Carbon	33K ohms 1/16W
R109-112	YF2116362JT	Carbon	3.6K ohms 1/16W
R116	YF2116333GT	Carbon	33K ohms 1/16W
R117	YF2116104JT	Carbon	100K ohms 1/16W
R118	YF2116680JT	Carbon	68 ohms 1/16W
R119,120	YF2116473GT	Carbon	47K ohms 1/16W
R121	YF2116512JT	Carbon	5.1K ohms 1/16W
R122,123	YF2116473GT	Carbon	47K ohms 1/16W
R124	YF2116512JT	Carbon	5.1K ohms 1/16W
R125,126	YF2116104JT	Carbon	100K ohms 1/16W
R127	YF2116682JT	Carbon	6.8K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R128	YF2116102GT	Carbon	1K ohms 1/16W
R129,130	YF2116473GT	Carbon	47K ohms 1/16W
R131,132	YF2116104JT	Carbon	100K ohms 1/16W
R133,134	YF2116561JT	Carbon	560 ohms 1/16W
R135,136	YF2116431JT	Carbon	430 ohms 1/16W
R137	YF2116101JT	Carbon	100 ohms 1/16W
R138	YF2116104JT	Carbon	100K ohms 1/16W
R139,140	YF2116103JT	Carbon	10K ohms 1/16W
R141	YF2116101JT	Carbon	100 ohms 1/16W
R142	YF2116104JT	Carbon	100K ohms 1/16W
R143,144	YF2116103JT	Carbon	10K ohms 1/16W
R145	YF2116473GT	Carbon	47K ohms 1/16W
R146	YF2116563JT	Carbon	56K ohms 1/16W
R147,148	YF2116222GT	Carbon	2.2K ohms 1/16W
R149	YF2116823JT	Carbon	82K ohms 1/16W
R150	YF2116824JT	Carbon	820K ohms 1/16W
R151,152	YF2116151JT	Carbon	150 ohms 1/16W
R153,154	YF2116201JT	Carbon	200 ohms 1/16W
R160,161	YF2116332JT	Carbon	3.3K ohms 1/16W
R162,163	YF2116224JT	Carbon	220K ohms 1/16W
R164-165	YF2116223JT	Carbon	22K ohms 1/16W
R166	YF2116511JT	Carbon	510 ohms 1/16W
R167	YF2116333GT	Carbon	33K ohms 1/16W
R201,202	YF2116102GT	Carbon	1K ohms 1/16W
R203,204	YF2116222GT	Carbon	2.2K ohms 1/16W
R205	YF2116102GT	Carbon	1K ohms 1/16W
R206	YF2116152JT	Carbon	1.5K ohms 1/16W
R207	ERDS2TJ100	Carbon	10 ohms 1/4W
R210,211	YF2116153JT	Carbon	15K ohms 1/16W
R212	YF2116472GT	Carbon	4.7K ohms 1/16W
VR1,2	YWRS301103B5	Variable Resistor	10K ohms
VR3,4	YWRS302102B5	Variable Resistor	1K ohm
VR5	YWRS302503A5	Variable Resistor	50K ohms
VR6	YWRS302503B5	Variable Resistor	50K ohms
VR7	YWRS302503A5	Variable Resistor	50K ohms
VR8	YWH0621A15K	Variable Resistor	15K ohms
VR9	YWRS301503A5	Variable Resistor	50K ohms
VR10,11	YFH0621A10K	Variable Resistor	10K ohms
VR12	YFH0621A220K	Variable Resistor	220K ohms
VR13	YFH0621A2R2M	Variable Resistor	2.2M ohms
C1,2	ECEA0JK220	Electrolytic	22 µF 6.3V
C3	ECEA1VKS4R7	Electrolytic	4.7 µF 35V
C4	YF400330CHJT	Ceramic	33 pF
C5	ECEA0JK220	Electrolytic	22 µF 6.3V
C6	ECEA1AS470	Electrolytic	47 µF 10V
C7	ECEA1HKS010	Electrolytic	1 µF 50V
C8	YF400330CHJT	Ceramic	33 pF
C9	ECEA0JS470	Electrolytic	47 µF 6.3V
C10	ECEA1AKS330	Electrolytic	33 µF 10V
C11	ECEA0JK220	Electrolytic	22 µF 6.3V
C12	YWT316B104MT	Ceramic	0.1 µF
C13	ECEA1CKS470	Electrolytic	47 µF 16V
C14	ECEA1VKS4R7	Electrolytic	4.7 µF 35V
C15	YF400330CHJT	Ceramic	33 pF

REF.NO.	PART NO.	DESCRIPTION	
C16	ECEA0JK220	Electrolytic	22 µF 6.3V
C17	ECEA1VKS4R7	Electrolytic	4.7 µF 35V
C18	YF400330CHJT	Ceramic	33 pF
C19	ECEA0JK220	Electrolytic	22 µF 6.3V
C20-22	ECEA0JU471	Electrolytic	470 µF 6.3V
C23-28	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C29	YF400470CHJT	Ceramic	47 pF
C30	ECEA1HKS010	Electrolytic	1 µF 50V
C31	YF400470CHJT	Ceramic	47 pF
C32	ECEA1HKS010	Electrolytic	1 µF 50V
C33	YF400470CHJT	Ceramic	47 pF
C34	ECEA1HKS010	Electrolytic	1 µF 50V
C35	YF400470CHJT	Ceramic	47 pF
C37	ECEA1AKS330	Electrolytic	33 µF 10V
C38	ECEA1CU101	Electrolytic	100 µF 16V
C39	ECEA1AS470	Electrolytic	47 µF 10V
C40	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C41,42	ECEA1AKS220	Electrolytic	22 µF 10V
C43	YF400682XKT	Ceramic	6800P
C44,45	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C46	YF400470CHJT	Ceramic	47 pF
C47	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C48	YF400470CHJT	Ceramic	47 pF
C49	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C50	ECEA1CKA101	Electrolytic	100 µF 16V
C51	ECEA1AKS220	Electrolytic	22 µF 10V
C52	ECEA1AS470	Electrolytic	47 µF 10V
C53	ECEA1CKS100	Electrolytic	10 µF 16V
C54,55	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C56,57	YF400470CHJT	Ceramic	47 pF
C58,59	ECEA1AKA101	Electrolytic	100 µF 10V
C60	ECEA1EK100	Electrolytic	10 µF 10V
C61	YF400470CHJT	Ceramic	47 pF
C62	ECEA1HKS010	Electrolytic	1 µF 50V
C63	ECEA1EK3R3	Electrolytic	3.3 µF 25V
C64	ECEA1EK100	Electrolytic	10 µF 10V
C65	YF400470CHJT	Ceramic	47 pF
C66	ECEA1HKS010	Electrolytic	1 µF 50V
C67	ECEA1EK3R3	Electrolytic	3.3 µF 25V
C68,69	ECEA1EK100	Electrolytic	10 µF 10V
C70,71	ECEA1HKS010	Electrolytic	1 µF 50V
C72	ECEA1CKS4R7	Electrolytic	4.7 µF 16V
C74	ECEA1CSS221	Electrolytic	220 µF 16V
C75	ECEA1AS470	Electrolytic	47 µF 10V
C76	ECEA1EKA470	Electrolytic	47 µF 25V
C77,78	YWT316B104MT	Ceramic	0.1 µF
C79	ECEA1CKS100	Electrolytic	10 µF 16
C80,81	ECEA1EK100	Electrolytic	10 µF 10V
C82	ECEA1CKS100	Electrolytic	10 µF 16V
C83	YWT316B104MT	Ceramic	0.1 µF
C84	ECEA1CKS100	Electrolytic	10 µF 16V
C85,86	YWT316B104MT	Ceramic	0.1 µF
C87	ECEA1CKS100	Electrolytic	10 µF 16V

REF.NO.	PART NO.	DESCRIPTION	
C88	YWT316B104MT	Ceramic	0.1 µF
C89	ECEA1CKS100	Electrolytic	10 µF 16V
C90	YWT316B104MT	Ceramic	0.1 µF
C91	ECEA1CKS100	Electrolytic	10 µF 16V
C92	YWT316B104MT	Ceramic	0.1 µF
C93	ECEA1CKS100	Electrolytic	10 µF 16V
C94	YWT316B104MT	Ceramic	0.1µ F
C95	ECEA1CKS100	Electrolytic	10 µF 16V
C96	YWT316B104MT	Ceramic	0.1 µF
C97	ECEA1CKS100	Electrolytic	10 µF 16V
C98	YWT316B104MT	Ceramic	0.1 µF
C99,100	ECEA1CKS100	Electrolytic	10 µF 16V
C101,104	YWT316B104MT	Ceramic	0.1 µF
C105	YWT316B104MT	Ceramic	0.1 µF
C106	ECEA1CKS100	Electrolytic	10 µF 16V
C107,108	YWT316B104MT	Ceramic	0.1 µF
C109	ECEA1CKS100	Electrolytic	10 µF 16V
C110	ECEA0JS470	Electrolytic	47 µF 6.3V
C112	ECEA1CKS100	Electrolytic	10 µF 16V
C113	YWT316B104MT	Ceramic	0.1 µF
C114	ECEA1EU101	Electrolytic	100 µF 25V
C115	ECSF1AE106	Tantalum	10 µF 10V
C116	YF400152XKT	Ceramic	1500 pF
C117	YWT316B104MT	Ceramic	0.1 µF
C118	YF411101SLJT	Ceramic	100 pF
C119,120	YWT316B104MT	Ceramic	0.1 µF
C121,122	YF400101SLJT	Ceramic	100 pF
C123,124	YF400100CHDT	Ceramic	10 pF
C127,128	YF400473FZT	Ceramic	0.047 µF
C129	ECEA0JK220	Electrolytic	22 µF 6.3V
C130,131	ECEA0JU471	Electrolytic	470 µF 6.3V
C132-135	YF400221SLKT	Ceramic	220 pF
C136	YF400331SLKT	Ceramic	330 pF
C137,138	ECKF1H221KB	Ceramic	220 pF 50V
L1-4	YWLAL2KR470K	Coil	47 µH
L5	YWLAL2KR1R0K	Coil	1 µH
L6,8	YWLAL2KR8R2K	Coil	8.2 µH
CF1	YWY5G0382	Filter	
CN1-JM	EMCS1250ZL	12 pin Jack Male	
CN2-JM	EMCS1150ZL	11 pin Jack Male	
CN3-JM	EMCS0650ZL	6 pin Jack Male	
CN4-JM	EMCS0850ZL	8 pin Jack Male	
CN5-JM	EMCS0650ZL	6 pin Jack Male	
CN6-JM	EMCS0250ZL	2 pin Jack Male	
CN7-JM	EMCS0650ZL	6 pin Jack Male	
CN8-JM	EMCS0350ZL	3 pin Jack Male	
CN9-JM	EMCS0550ZL	5 pin Jack Male	
CN10-JM	EMCS0650ZL	6 pin Jack Male	
CN11-JM	EMCS1250ZL	12 pin Jack Male	
CN12-JM	EMCS0550ZL	5 pin Jack Male	
CN13-JM	EMCS0350ZL	3 pin Jack Male	
M43	YWV2HA0561A4	Upper Shield Case	
M44	YWV2HA0562A4	Bottom Shield Case	
M45	YWV2PA0266A4	Insulator Paper	

CONTROL BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB10(NLA)	o YWJKZMX10E3A	Printed Circuit Board Assy	
IC1	YWBA7230LS	IC	
IC2-4	MN74HC148S	IC	
IC5	MN74HC158S	IC	
IC6	MN74HC00S	IC	
IC7	MN74HC32S	IC	
IC8	MN74HC04S	IC	
IC9,10	MN74HC32S	IC	
IC11	MN1554CCD1	IC	
IC12	M51951ASL	IC	
IC13	NJM3414M	IC	
IC14,15	BA226AF	IC	
IC16,17	NJM4560M	IC	
IC18	AN6914S	IC	
IC19,20	BA226AF	IC	
IC21-23	NJM4560M	IC	
IC24	MN74HC86S	IC	
IC25	MN74HC08S	IC	
IC26	MN4013BS	IC	
IC27	MN74HC04S	IC	
IC28,29	YWSC49069F	IC	
IC30	MN74HC175S	IC	
IC31,32	MN4066BS	IC	
IC33	MN74HC02S	IC	
IC34,35	AN78L05	IC	
Q1	2SC2404-CDTW	Transistor	
Q2	2SA1022-C	Transistor	
Q3	2SC2404-CDTW	Transistor	
Q4	2SA1022-C	Transistor	
Q5-8	2SB709-Q	Transistor	
Q9	2SC2404-CDTW	Transistor	
Q10	2SA1022-C	Transistor	
Q11,12	2SD601-RS	Transistor	
Q13	2SB709-Q	Transistor	
Q14	2SD601-RS	Transistor	
Q15	2SA1022-C	Transistor	
Q16	2SC2404-CDTW	Transistor	
Q17,18	2SD601-RS	Transistor	
Q19-21	2SB709-Q	Transistor	
D1,2	MA151K	Diode	
D3	MA151K	Diode	
D4	MA151K	Diode	
R1	YF2116223JT	Carbon	22K ohms 1/16W
R2	YF2116102GT	Carbon	1K ohms 1/16W
R3	YF2116223JT	Carbon	22K ohms 1/16W
R4	YF2116102GT	Carbon	1K ohms 1/16W
R5-7	YF2116511JT	Carbon	510 ohms 1/16W
R8	YF2116752JT	Carbon	7.5K ohms 1/16W
R9	YF2116511JT	Carbon	510 ohms 1/16W
R10	YF2116752JT	Carbon	7.5K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R11,12	YF2116512JT	Carbon	5.1K ohms 1/16W
R13	YF2116752JT	Carbon	7.5K ohms 1/16W
R14	YF2116122JT	Carbon	1.2K ohms 1/16W
R15	YF2116222GT	Carbon	2.2K ohms 1/16W
R16	YF2116752JT	Carbon	7.5K ohms 1/16W
R17	YF2116122JT	Carbon	1.2K ohms 1/16W
R18	YF2116222GT	Carbon	2.2K ohms 1/16W
R19	YF2116752JT	Carbon	7.5K ohms 1/16W
R20	YF2116122JT	Carbon	1.2K ohms 1/16W
R21,22	YF2116222GT	Carbon	2.2K ohms 1/16W
R23	YF2116913JT	Carbon	91K ohms 1/16W
R24	YF2116123JT	Carbon	12K ohms 1/16W
R25	YF2116103JT	Carbon	10K ohms 1/16W
R26,27	YF2116512JT	Carbon	5.1K ohms 1/16W
R28,29	YF2116222GT	Carbon	2.2K ohms 1/16W
C10	YF400103XMT	Ceramic	0.01 µF
C11	ECEA1EK100	Electrolytic	10 µF 10V
C12	YWT316B104MT	Ceramic	0.1 µF
C13	ECEA1EK100	Electrolytic	10 µF 10V
C14,15	ECEA1HKS010	Electrolytic	1 µF 50V
C16	YWE316F105ZT	Ceramic	1 µF
C17	YF400330CHJT	Ceramic	33 pF
C18	ECEA0JS470	Electrolytic	47 µF 6.3V
C19	YWE316F105ZT	Ceramic	1 µF
C20	YF400330CHJT	Ceramic	33 pF
C21	YWE316F105ZT	Ceramic	1 µF
C22	YF400330CHJT	Ceramic	33 pF
C23,24	ECEA0JS470	Electrolytic	47 µF 6.3V
C25-30	YWT316B104MT	Ceramic	0.1µ F
C31,32	ECSF1AE106	Electrolytic	10 µF 10V
C33	YWT316B104MT	Ceramic	0.1 µF
C34	ECSF1AE106	Electrolytic	10 µF 10V
C36	ECEA0JS221	Electrolytic	220 µF 6.3V
C37	YWT316B104MT	Ceramic	0.1 µF
C38,39	YF400330CHJT	Ceramic	33 pF
C40	YF400102SLKT	Ceramic	1000 pF SL
C41	YF400821SLJT	Ceramic	820 pF
C42	YF400390CHJT	Ceramic	39 pF
C43	YF400102SLKT	Ceramic	820 pF
C45,46	YF400102XMT	Ceramic	1000 pF
C48	YF400101CHJT	Ceramic	100 pF
C49	ECQM1H334KZ	Plastic	0.33 µF
C50	ECQV05224JC	Plastic	0.22 µF 50V
C51	YF400561SLKT	Ceramic	560 pF
C52	ECQV05224JC	Plastic	0.22 µF 50V
C54,55	YF400333XKT	Ceramic	0.033 µF
C57	YF400332XKT	Ceramic	3300 pF
C58	ECEA0JK220	Electrolytic	22 µF 6.3V
C59	ECEA1AKS220	Electrolytic	22 µF 10V
C60	ECEA1EK100	Electrolytic	10 µF 10V
C61	YWT316B104MT	Ceramic	0.1 µF
C62,63	YF400561SLKT	Ceramic	560 pF
C64,65	YF400821XKT	Ceramic	820pF
C66,67	YWT316B104MT	Ceramic	0.1 µF
C68	ECEA1EK100	Electrolytic	10 µF 10V

REF.NO.	PART NO.	DESCRIPTION	
C69,70	YWT316B104MT	Ceramic	0.1 µF
C71	ECEA1EKS100	Electrolytic	10 µF 25V
C73	ECEA1EK100	Electrolytic	10 µF 10V
C74,75	YWT316B104MT	Ceramic	0.1 µF
C76	ECEA1EKS100	Electrolytic	10 µF 25V
C77	YWT316B104MT	Ceramic	0.1 µF
C78	ECEA1CKS470	Electrolytic	47 µF 16V
C79	ECEA1AS470	Electrolytic	47 µF 10V
C80	ECEA0JS470	Electrolytic	47 µF 6.3V
C81	YF400100CHDT	Ceramic	10 pF
C82-84	YWT316B104MT	Ceramic	0.1 µF
C85	ECSF1AE336	Electrolytic	33 µF 10V
C86	ECEA1AS470	Electrolytic	47 µF 10V
C87	ECEA1HKS010	Electrolytic	1 µF 50V
C88	YWT316B104MT	Ceramic	0.1 µF
C89	ECEA1AS470	Electrolytic	47 µF 10V
C90	ECEA1HKS010	Electrolytic	1 µF 50V
C92	YF400100CHDT	Ceramic	10 pF
C93	YF400101CHJT	Ceramic	100 pF
C94-98	YF400470CHJT	Ceramic	47 pF
C99	ECEA1CSS102	Electrolytic	1000 µF 16V
C100	ECEA1CK220	Electrolytic	22 µF 16V
C101,102	YWT316B104MT	Ceramic	0.1 µF
L1	YWLAL2KR1R0K	Coil	1 µH
L2	YWLAL2KR8R2K	Coil	8.2 µH
L3-5	YWLAL2KR470K	Coil	47 µH
L6,7	YWLAL2KR8R2K	Coil	8.2 µH
SW1	YWSRRM1815	Rotary Switch	
SW2	YWSRRM2615	Rotary Switch	
SW3	YWSRRM1815	Rotary Switch	
X1	KBR-3.58MS	Oscillator	
J2,55	YF21160R00T	Jamper Resister	
J69	YF21160R00T	Jamper Resister	
CN1	EMCS0850ZL	8 pin Jack Male	
CN2	YWA219PA25DS	19 pin Connector	
CN3	YWA213PA25DS	13 pin Connector	
CN4	EMCS0350ZL	3 pin Jack Male	

ACCESSORY PARTS/PACKAGING PARTS

M28	o YWV9AA0472AN	Mounting Base for WV-KB12
M51	o YWV8QA1523AN	Operating Instructions
M52	YWV7SA0851B4	Label
M53	XZB26X40C05	Polyethylene Bag
M54	XZB55X71C1	Polyethylene Bag
M55	o YWV9CA1115AN	Packaging

Printed in Japan
C-130 Ⓕ 3,5,6

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ORDER NO. AVS88102198

Service Manual

Production Mixer
WJ-MX10

Supplement-1

Please use this suppliment-1 service manual together with the original service manual for Model No. WJ-MX10 Order No. AVS88052097C8

LIST OF MODIFICATION

■ CONTROL BOARD

- Pattern foil of Control board have been changed to inprove the productivity effected from serial number 8XA0001 and higher.
- R91 has been added to prevent the wipe distortion when joystick positioner is used effected from serial number 87A00001 and higher.
- The value of R78 and C81 have been changed to meet the phase of back colour effected from serial number 87A00001 and higher.
- The value of C41 has been changed to compensate the function of VR2(H.CENT-2) effected from serial number 86A00001 and higher
- Replacement parts list of Control board have been corrected.

■ SYNC BOARD

- Pattern foil of Sync board has been changed to improve productivity effected from serial number 8XA00001.
- The value of C304 and C311 have been changed for stabilizing the VCO frequency effected from serial number 87A0001 and higher.
- Transistors Q53 and Q56 have been changed to prevent the leak current from oscillator circuit effected from serial number 87A00001 and higher.
- The value of resistors (R74, R84, R142, R147, R157, R304, R314) and capacitors (C85, C147, C304, C311) have been changed , and resistors (R86, R159) have been removed to reduce jitter noise effected from serial number 87JA00001 and higher.
- Pin number of block resistors (Z1, Z2, Z3) have been corrected.

■ MIXER BOARD

- Pattern foil of Mixer board has been changed to improve productivity effected from serial number 8XA00001 and higher.
- Due to change the pattern hoil of Mixer board, capacitors C137 and C138 have been changed from lead type to chip type.

Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

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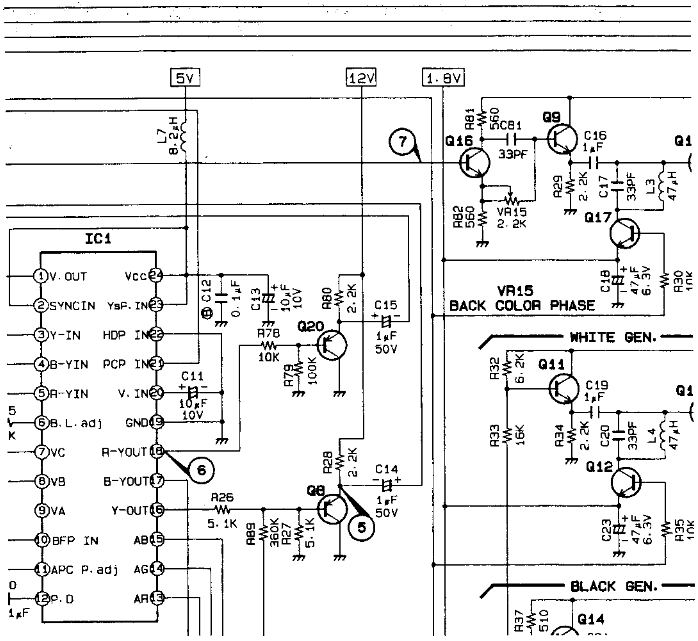
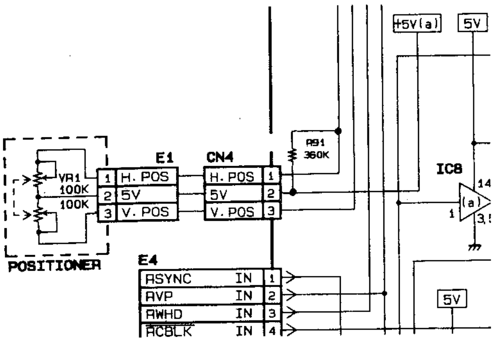
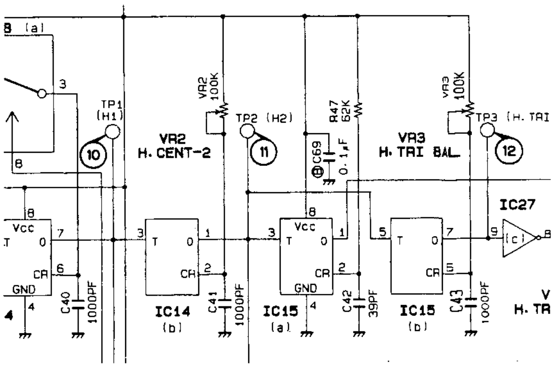
SCHEMATIC DIAGRAM OF CONTROL BOARD


5V
12V
1.8V
L7 8.2μH
IC1
V.OUT
SYNCIN
Y-IN
B-YIN
R-YIN
B.L.adj
VC
VB
VA
BFP IN
APC P.adj
P.D
Vcc
YsF.IN
HDP IN
PCP IN
V.IN
GND
R-YOUT
B-YOUT
Y-OUT
AB
AG
AR
C12 0.1μF
C13 10μF 10V
C11 10μF 10V
R78 10K
R79 100K
R80 2.2K
Q20
C15 1μF 50V
R28 2.2K
C14 1μF 50V
Q8
R26 5.1K
R89 360K
R27 5.1K
R81 560
C81 33PF
Q9
Q16
R82 560
VR15 2.2K
R29 2.2K
C16 1μF
C17 33PF
L3 47μH
Q17
C18 47μF 6.3V
R30 10K
VR15
BACK COLOR PHASE
WHITE GEN.
R32 6.2K
Q11
C19 1μF
R33 16K
R34 2.2K
C20 33PF
L4 47μH
Q12
C23 47μF 6.3V
R35 10K
BLACK GEN.
R37 510
Q14
⑤
⑥
⑦

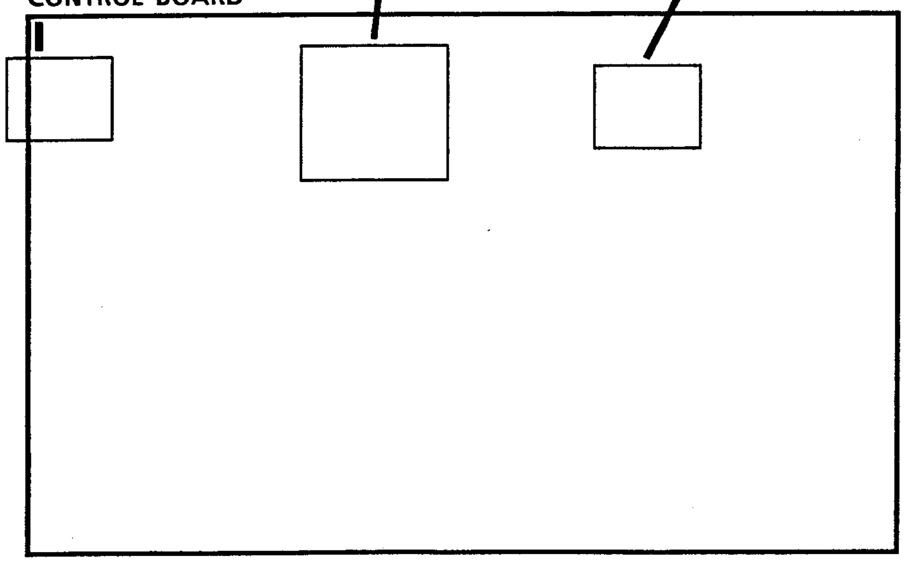
Value of R78 and C81 have been changed.


+5V(a)
5V
R91 360K
IC8
VR1 100K
100K
E1
CN4
H. POS
5V
V. POS
POSITIONER
E4
RSYNC IN
RVP IN
RWHD IN
RCBLK IN


TP1 (H1)
⑩
VR2 100K
VR2
H. CENT-2
TP2 (H2)
⑪
R47 62K
C69 0.1μF
VR3 100K
VR3
H. TRI BAL
TP3 (H. TRI
⑫
IC27
C40 1000PF
IC14 (b)
C41 1000PF
IC15 (a)
C42 39PF
IC15 (b)
C43 1000PF
H. TR

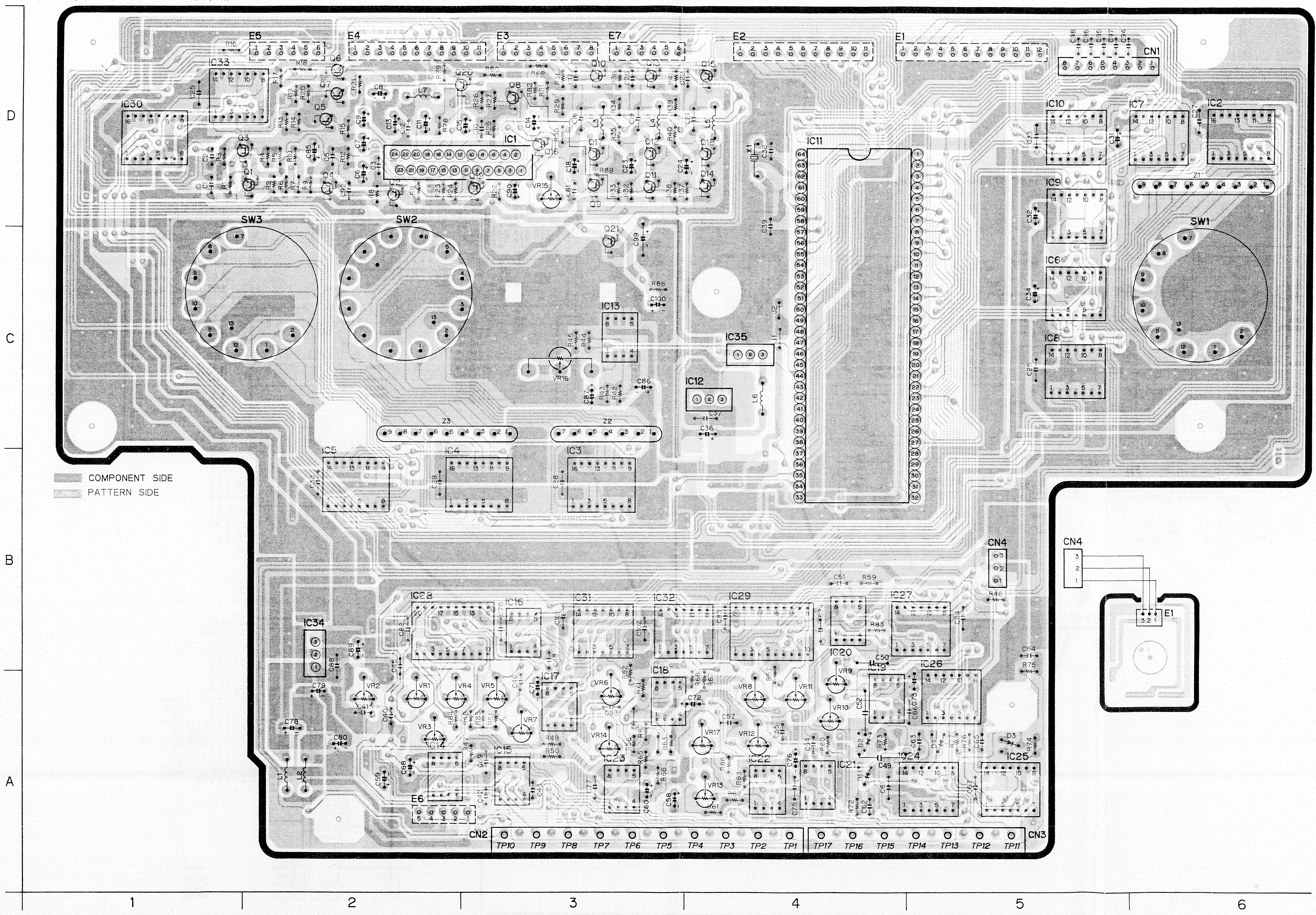
R91 has been added

Value of C41 has been changed .


CONTROL BOARD

CONDUCTOR VIEW OF CONTROL BOARD

CONTROL BOARD


D
C
B
A
1
2
3
4
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E5
E4
E3
E7
E2
E1
CN1
IC30
IC33
IC1
IC11
IC10
IC7
IC2
IC9
IC6
IC8
SW3
SW2
SW1
Z1
Z2
Z3
IC13
IC35
IC12
VR15
VR16
X1
IC5
IC4
IC3
CN4
IC28
IC16
IC31
IC32
IC29
IC27
IC34
IC20
IC19
IC26
IC17
IC18
IC14
IC15
IC23
IC22
IC21
IC24
IC25
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
VR9
VR10
VR11
VR12
VR13
VR14
VR17
E6
CN2
CN3
TP10
TP9
TP8
TP7
TP6
TP5
TP4
TP3
TP2
TP1
TP17
TP16
TP15
TP14
TP13
TP12
TP11

▨ COMPONENT SIDE

▨ PATTERN SIDE

REPLACEMENT PARTS LIST

REFERENCE NO.	ORIGINAL PART NO.	NEW PART NO.	DESCRIPTION
SYNC BOARD			
Q53	2SC2404-CDTW	2SD601-QRSTW	Transistor
Q56	2SC2404-CDTW	2SD601-QRSTW	Transistor
R74	YF2116153JT	YF2116392JT	Carbon 3.9K ohms 1/16W
R84	YF2116682JT	YF2116183JT	Carbon 18K ohms 1/16W
R86	YF2116333GT	---------------	Delection
R142	YF2116222GT	YF2116562JT	Carbon 5.6K ohms 1/16W
R147	YF2116153JT	YF2116392JT	Carbon 3.9K ohms 1/16W
R157	YF2116682JT	YF2116133JT	Carbon 13K ohms 1/16W
R159	YF2116333GT	---------------	Delection
R304	YF2116752JT	YF2116332JT	Carbon 3.3K ohms 1/16W
R314	YF2116103JT	YF2116332JT	Carbon 3.3K ohms 1/16W
C85	YF400822XKT	YF4008102XKT	Ceramic 1000PF
C147	YF400822XKT	YF4008102XKT	Ceramic 1000PF
C304	YF400100CHDT	YF400060CHDT	Ceramic 6PF
C311	YF400100CHDT	YF400060CHDT	Ceramic 6PF
MIXER BOARD			
C137,138	ECKF1H221KB	YF400221CHJT	Ceramic 220PF
CONTROL BOARD			
R30	------------	YF2116103JT	Carbon 10K ohms 1/16W
R31	------------	YF2116222GT	Carbon 2.2K ohms 1/16W
R32	------------	YF2116622JT	Carbon 6.2K ohms 1/16W
R33	------------	YF2116163JT	Carbon 16K ohms 1/16W
R34	------------	YF2116222GT	Carbon 2.2K ohms 1/16W
R35	------------	YF2116103JT	Carbon 10K ohms 1/16W
R36	------------	YF2116222GT	Carbon 2.2K ohms 1/16W
R37	------------	YF2116511JT	Carbon 510 ohms 1/16W
R38	------------	YF2116223JT	Carbon 22K ohms 1/16W
R39	------------	YF2116222GT	Carbon 2 2K ohms 1/16W
R40	------------	YF2116103JT	Carbon 10K ohms 1/16W
R41	------------	YF2116222GT	Carbon 2.2K ohms 1/16W
R42,43	------------	YWR1220P473D	Metal 47K ohms
R44	------------	YWR1220P223D	Metal 22K ohms
R45	------------	YWR1220P563D	Metal 56K ohms
R46	------------	YF2116682JT	Carbon 6.8K ohms 1/16W
R47	------------	YF2116623JT	Carbon 62K ohms 1/16W
R48	------------	YF2116183GT	Carbon 18K ohms 1/16W
R49,50	------------	YF2116562JT	Carbon 5.6K ohms 1/16W
R51	------------	YF2116752JT	Carbon 7.5K ohms 1/16W
R52	------------	YF2116104JT	Carbon 100K ohms 1/16W
R53	------------	YYF2116101JT	Carbon 100 ohms 1/16W
R56	------------	YF2116102GT	Carbon 1K ohms 1/16W
R57	------------	YF2116302GT	Carbon 3K ohms 1/16W
R59	------------	YF2116623JT	Carbon 62K ohms 1/16W

REFERENCE NO.	ORIGINAL PART NO.	NEW PART NO.	DESCRIPTION
CONTROL BOARD			
R60	————	YF2116363JT	Carbon 36K ohms 1/16W
R61,62	————	YJ2116562JT	Carbon 5.6K ohms 1/16W
R63	————	YF2116682JT	Carbon 6.8K ohms 1/16W
R65	————	YF2116104JT	Carbon 100K ohms 1/16W
R66	————	YF2116203JT	Carbon 20K ohms 1/16W
R67	————	YF2116104JT	Carbon 100K ohms 1/16W
R68	————	YF2116101JT	Carbon 100 ohms 1/16W
R71	————	YF2116332JT	Carbon 3.3K ohms 1/16W
R72	————	YF2116512JT	Carbon 5.1K ohms 1/16W
R73	————	YF2116432JT	Carbon 4.3K ohms 1/16W
R74	————	YF2116222GT	Carbon 2.2K ohms 1/16W
R75	————	YF2116183GT	Carbon 18K ohms 1/16W
R76	————	YF2116102GT	Carbon 1K ohms 1/16W
R77	————	YF2116332JT	Carbon 3.3K ohms 1/16W
R78	————	YF2116103JT	Carbon 10K ohms 1/16W
R79	————	YF2116104JT	Carbon 100K ohms 1/16W
R80	————	YF2116222GT	Carbon 2.2K ohms 1/16W
R81,82	————	YF211656JT	Carbon 560K ohms 1/16W
R83	————	YF2116912GT	Carbon 9.1K ohms 1/16W
R84	————	YF2116432JT	Carbon 4.3K ohms 1/16W
R85,86	————	YF2116392JT	Carbon 3.9K ohms 1/16W
R87	————	YF2116133GT	Carbon 13K ohms 1/16W
R88	————	YF2116392JT	Carbon 3.9K ohms 1/16W
R89,91	————	YF2116364JT	Carbon 360K ohms 1/16W
VR1-5	————	YFH0621A100K	Variable Resistor
VR6	————	YFH0621A10K	Variable Resistor 10K ohms
VR7,8	————	YFH0621A100K	Variable Resistor 100K ohms
VR9,10	————	YFH0621A220K	Variable Resistor 220K ohms
VR11,12	————	YFH0621A1M	Variable Resistor 1M ohms
VR13,14	————	YFH0621A10K	Variable Resistor 10K ohms
VR15	————	YFH0621A2R2K	Variable Resistor 2.2K ohms
VR16	————	RK16K1141MB	Variable Resistor 1M ohms
VR17	————	YFH0621A1M	Variable Resistor 1M ohms
Z1	————	YWRMLS8104J	Block Resistor
Z2	————	YWRMLS6104J	Block Resistor
Z3	————	YWRMLS8104J	Block Resistor
C1-3	————	YF400222XKT	Ceramic 2200 PF
C5	————	YF400222XKT	Ceramic 2200 PF
C6	————	ECSF1AE336	Electrolytic 33 UF 10V
C7-9	————	ECEA1HKS010	Electrolytic 1 UF 50V

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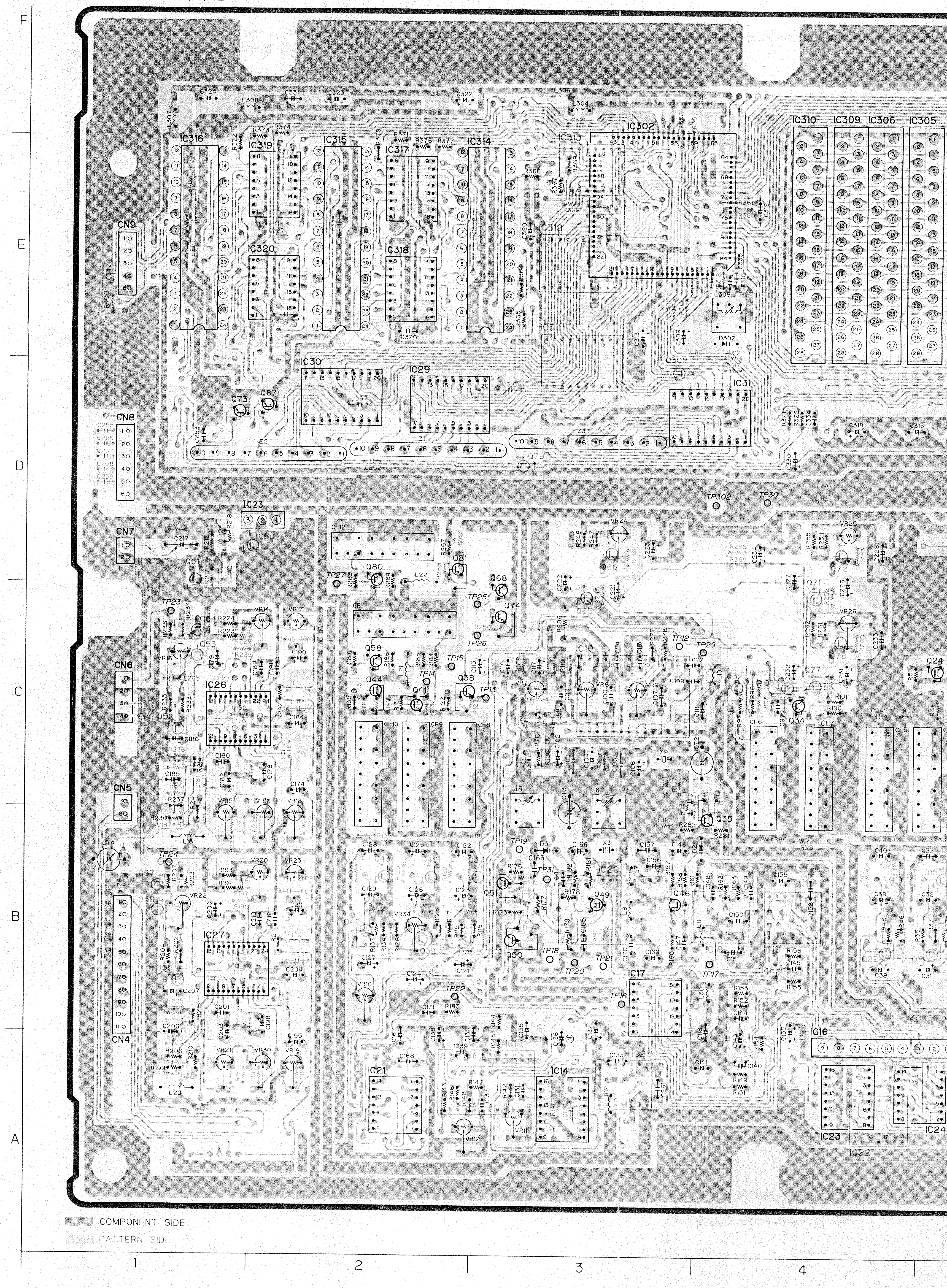
SYNC BOARD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C
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IC314
IC313
IC302
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IC306
IC305
IC320
IC318
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IC26
IC27
IC10
IC20
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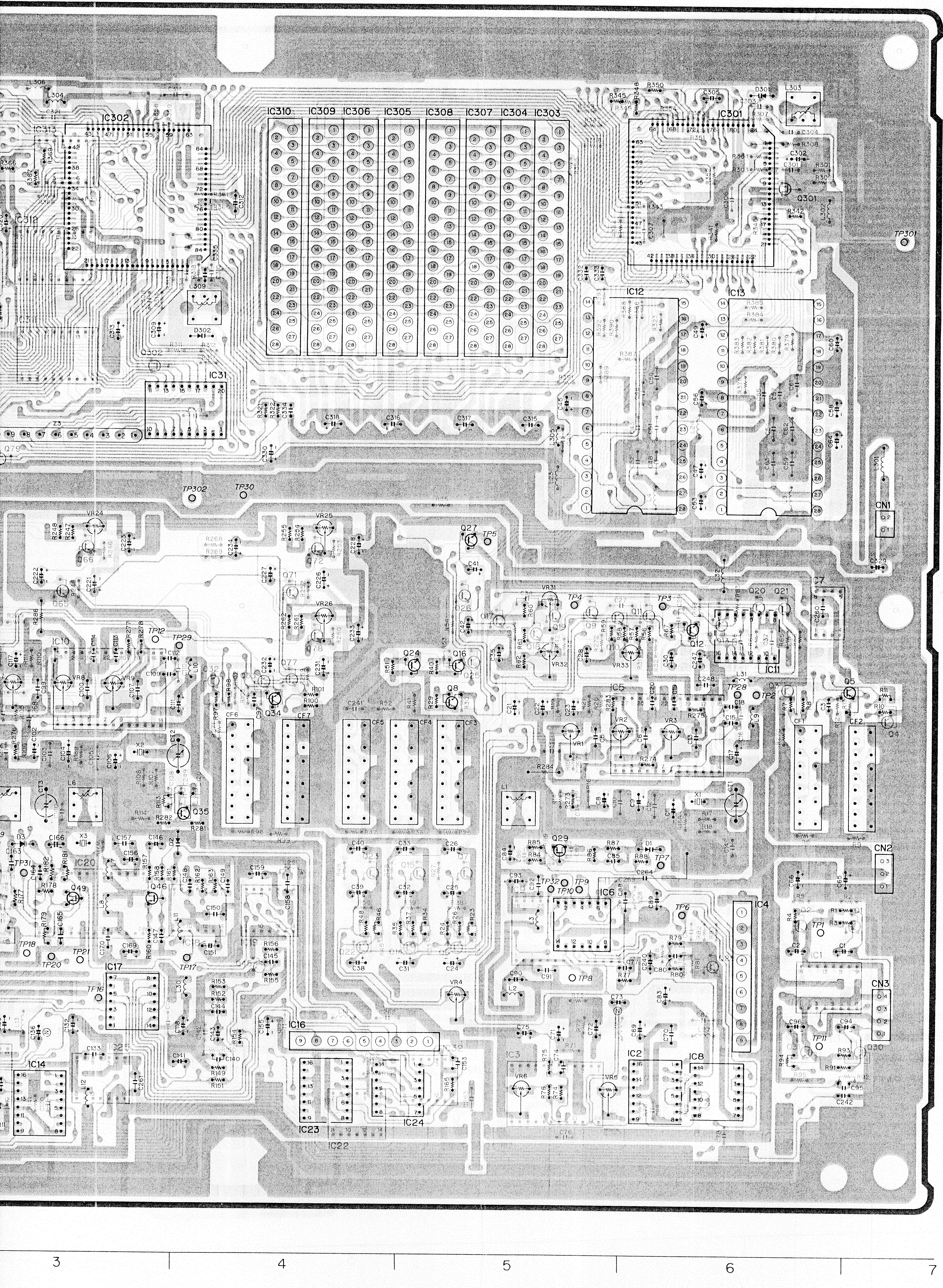
IC21
IC14
IC23
IC22
IC24
CN9
CN8
CN7
CN6
CN5
CN4
CF12
CF11
CF10
CF9
CF8
CF6
CF7
CF5
TP302
TP30
Z1
Z2
Z3
COMPONENT SIDE
PATTERN SIDE

CONDUCTOR VIEW OF SYNC BOARD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IC17
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IC23
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CF6
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CF3
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CF2
CN1
CN2
CN3
L303
L301
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D302
Q301
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TP2
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TP12
TP29
TP7
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VR24
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VR9
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VR5
VR6
Q27
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Q30
Q49
Q46
Q66
Q65
Q71
Q72
Q77
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X3
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L6
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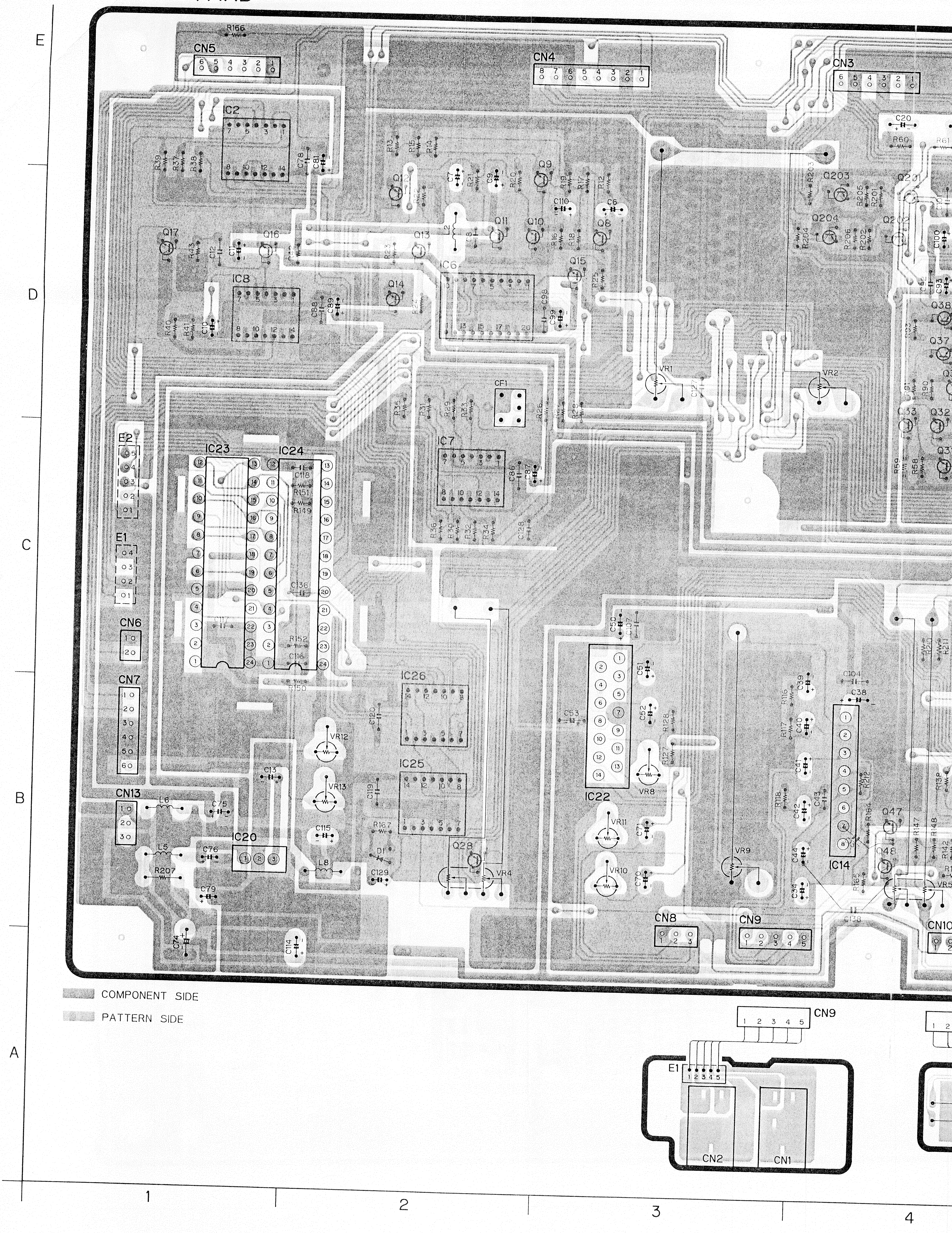
7

MIXER BOARD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D
C
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A
1
2
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4
CN5
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CN4
CN3
C20
R60
R61
IC2
R39
R37
R38
C78
C81
R13
R15
R14
Q12
C7
R21
C9
R20
Q9
R19
R17
R12
R203
Q203
R205
R201
Q201
Q204
R204
R206
R202
Q202
C100
C110
C6
Q17
R43
C12
C11
Q16
Q13
R23
L2
C8
Q11
Q10
R16
R18
Q8
Q15
R25
IC6
C98
C99
IC8
R40
R41
C10
C88
C89
Q14
R24
VR1
C127
VR2
Q38
Q37
Q33
Q32
CF1
R35
R31
R29
R33
R26
R28
E2
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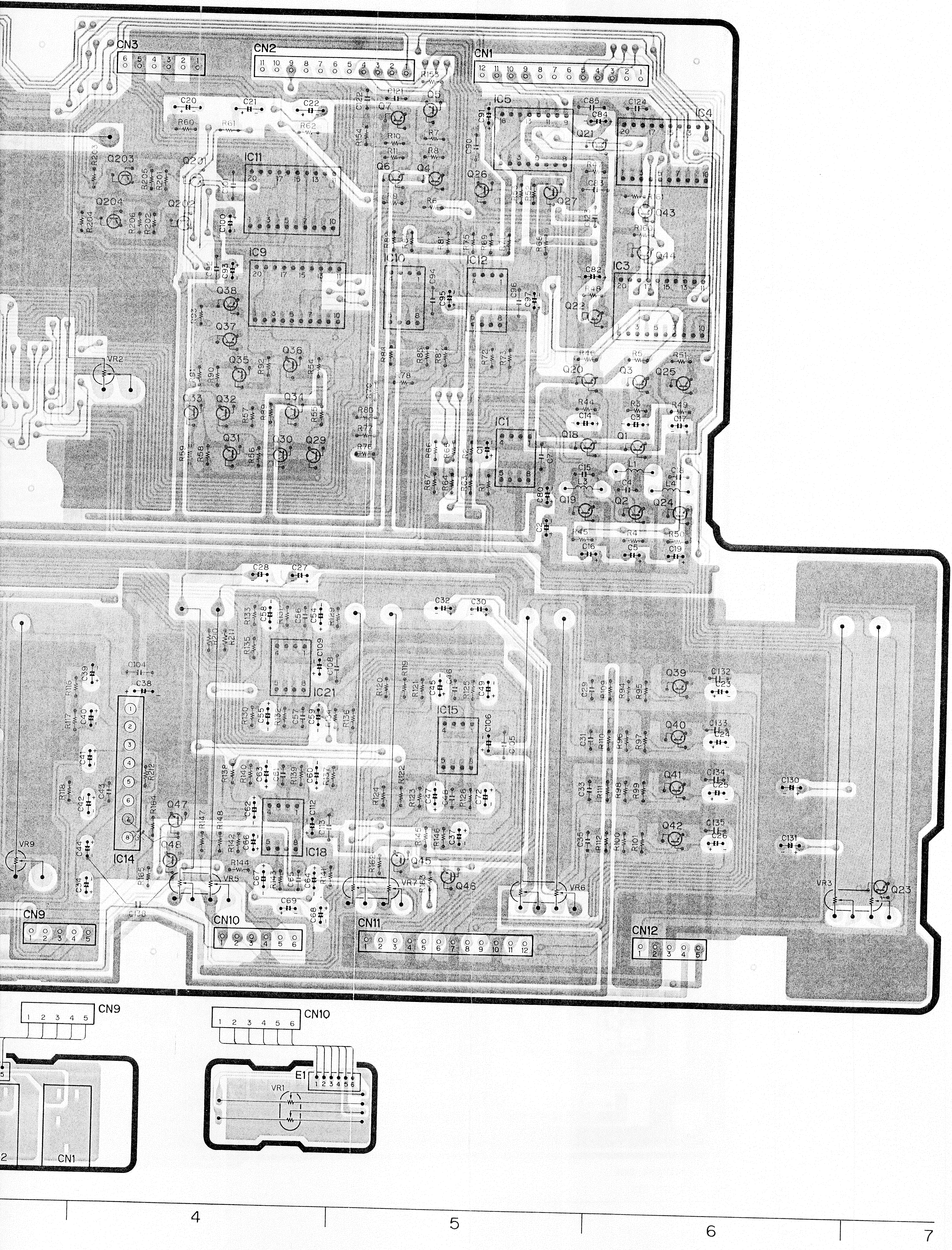
IC24
C118
R151
R149
IC7
C86
C87
R36
R30
R32
R34
C128
R59
R58
E1
CN6
C136
C117
R152
C116
R150
CN7
IC26
C120
VR12
VR13
C50
C107
C51
C52
C53
R128
R127
IC22
VR8
C39
R116
C104
C38
R117
C40
C41
R212
R118
C42
C43
R164
Q47
R147
R148
R142
CN13
L6
C75
C13
IC25
C119
VR11
C71
L5
C76
R207
IC20
C115
R167
D1
L8
C129
Q28
VR4
VR10
C70
VR9
C44
C34
IC14
R165
Q48
VR5
C130
C79
C74
C114
CN8
CN9
CN10
COMPONENT SIDE
PATTERN SIDE
CN9
E1
CN2
CN1

OR BOARD OF MIXER BOARD


CN3
CN2
CN1
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IC9
IC10
IC12
IC5
IC4
IC3
IC1
IC21
IC15
IC14
IC18
VR2
VR9
VR5
VR7
VR6
VR3
Q203
Q204
Q202
Q231
Q38
Q37
Q36
Q35
Q33
Q32
Q34
Q31
Q30
Q29
Q7
Q5
Q6
Q4
Q26
Q21
Q27
Q43
Q44
Q22
Q20
Q3
Q25
Q18
Q1
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Q24
Q39
Q40
Q41
Q42
Q47
Q48
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CN12
E1
VR1
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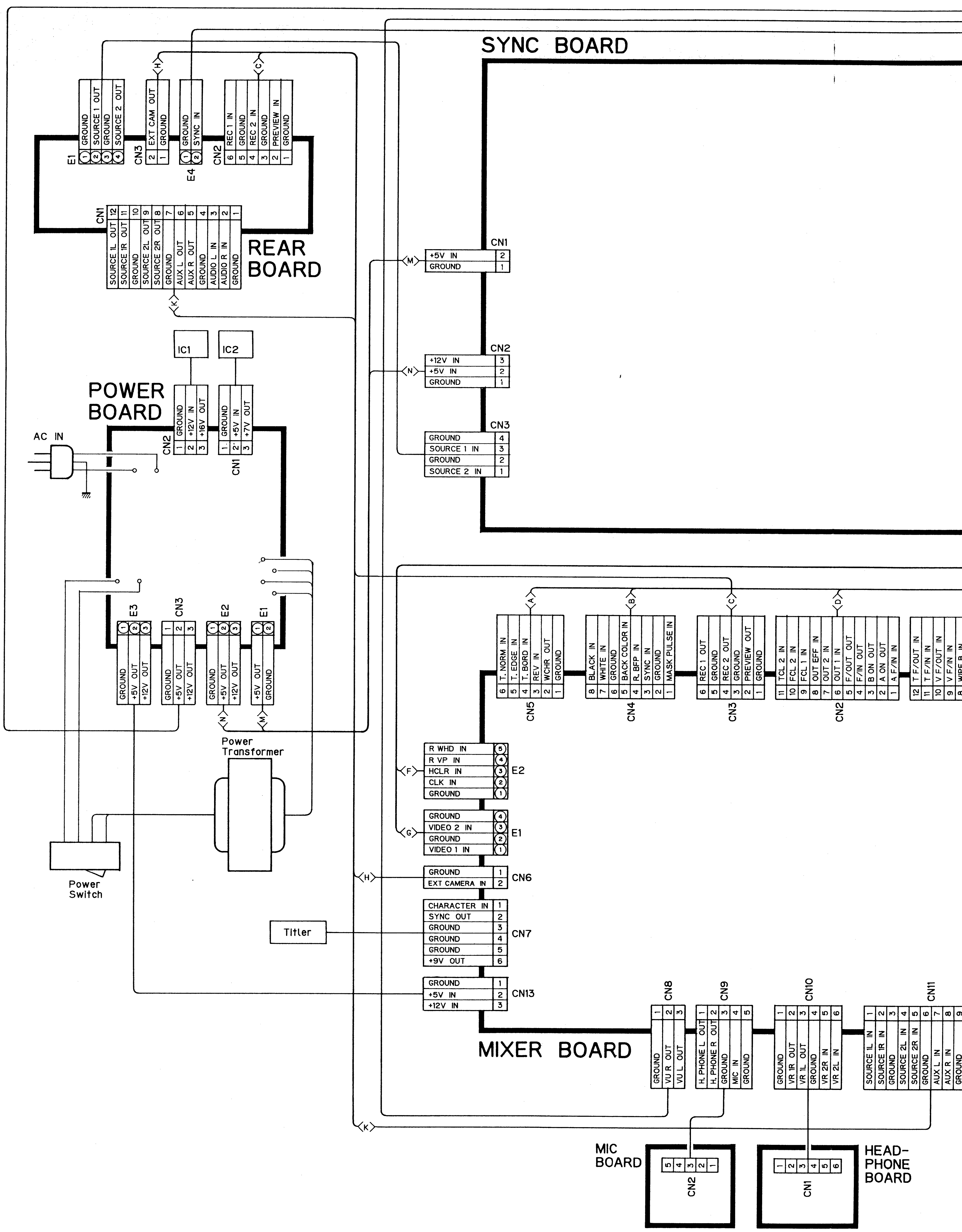
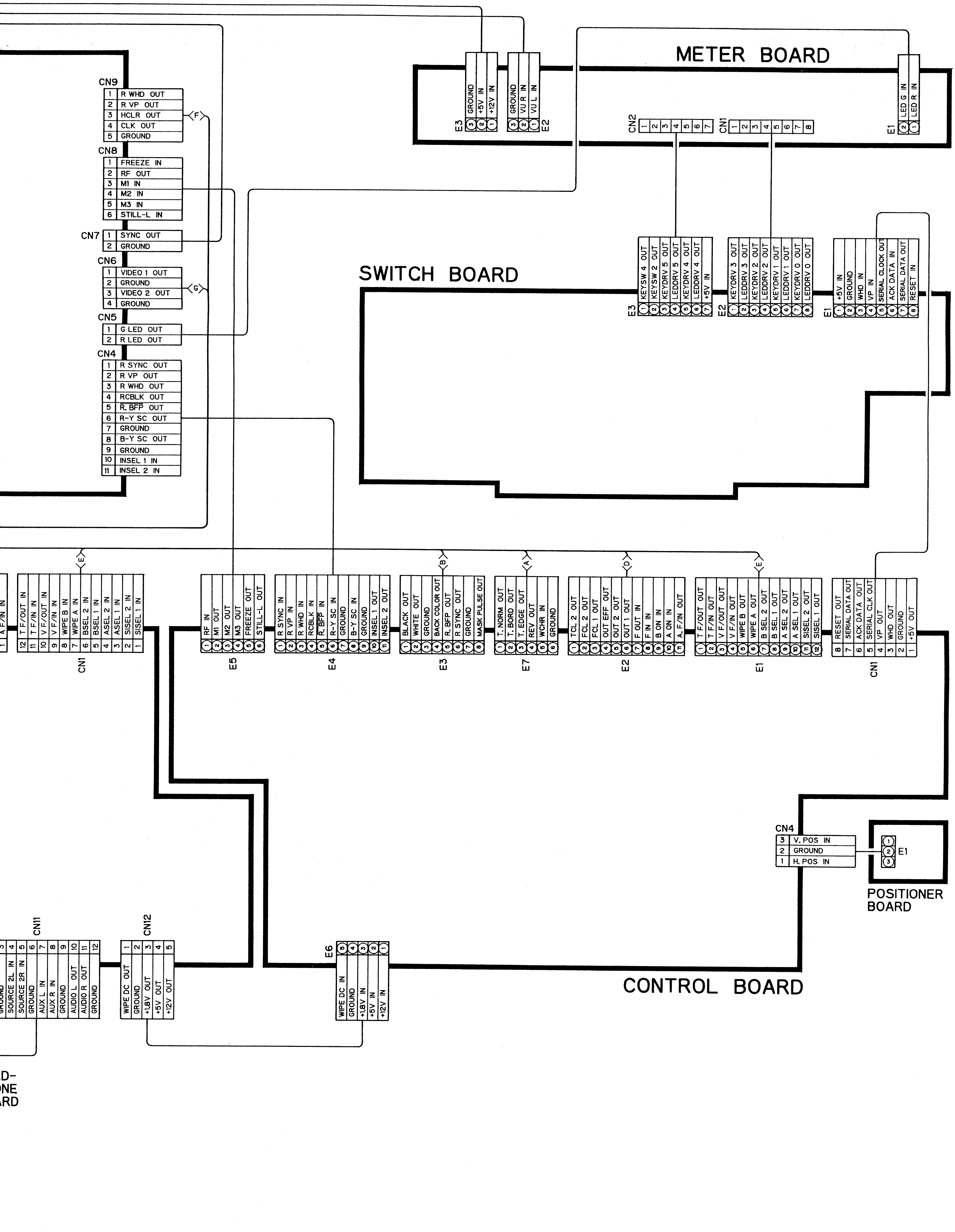
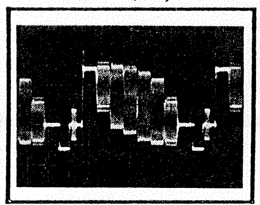

SYNC BOARD
REAR BOARD
E1
GROUND
SOURCE 1 OUT
GROUND
SOURCE 2 OUT
CN3
EXT CAM OUT
GROUND
E4
GROUND
SYNC IN
CN2
REC 1 IN
GROUND
REC 2 IN
GROUND
PREVIEW IN
GROUND
CN1
SOURCE 1L OUT
SOURCE 1R OUT
GROUND
SOURCE 2L OUT
SOURCE 2R OUT
GROUND
AUX L OUT
AUX R OUT
GROUND
AUDIO L IN
AUDIO R IN
GROUND
CN1
+5V IN
GROUND
CN2
+12V IN
+5V IN
GROUND
CN3
GROUND
SOURCE 1 IN
GROUND
SOURCE 2 IN
IC1
IC2
POWER BOARD
CN2
GROUND
+12V IN
+16V OUT
CN1
GROUND
+5V IN
+7V OUT
AC IN
E3
GROUND
+5V OUT
+12V OUT
CN3
GROUND
+5V OUT
+12V OUT
E2
GROUND
+5V OUT
+12V OUT
E1
+5V OUT
GROUND
Power Transformer
Power Switch
Titler
A
B
C
D
H
K
M
N
F
G
CN5
T. NORM IN
T. EDGE IN
T. BORD IN
REV IN
WCHR OUT
GROUND
CN4
BLACK IN
WHITE IN
GROUND
BACK COLOR IN
R. BFP IN
SYNC IN
GROUND
MASK PULSE IN
CN3
REC 1 OUT
GROUND
REC 2 OUT
GROUND
PREVIEW OUT
GROUND
CN2
TCL 2 IN
FCL 2 IN
FCL 1 IN
OUT EFF IN
OUT 2 IN
OUT 1 IN
F/OUT OUT
F/IN OUT
B ON OUT
A ON OUT
A F/IN IN
T F/OUT IN
T F/IN IN
V F/OUT IN
V F/IN IN
E2
R WHD IN
R VP IN
HCLR IN
CLK IN
GROUND
E1
GROUND
VIDEO 2 IN
GROUND
VIDEO 1 IN
CN6
GROUND
EXT CAMERA IN
CN7
CHARACTER IN
SYNC OUT
GROUND
GROUND
GROUND
+9V OUT
CN13
GROUND
+5V IN
+12V IN
MIXER BOARD
CN8
GROUND
VU R OUT
VU L OUT
CN9
H. PHONE L OUT
H. PHONE R OUT
GROUND
MIC IN
GROUND
CN10
GROUND
VR 1R OUT
VR 1L OUT
GROUND
VR 2R IN
VR 2L IN
CN11
SOURCE 1L IN
SOURCE 1R IN
GROUND
SOURCE 2L IN
SOURCE 2R IN
GROUND
AUX L IN
AUX R IN
GROUND
MIC BOARD
CN2
HEAD-PHONE BOARD
CN1

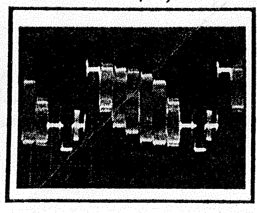
NG DIAGRAM


METER BOARD
E3: 3 GROUND, 2 +5V IN, 1 +12V IN
E2: 3 GROUND, 2 VU R IN, 1 VU L IN
CN2: 1 2 3 4 5 6 7
CN1: 1 2 3 4 5 6 7 8
E1: 2 LED G IN, 1 LED R IN
CN9: 1 R WHD OUT, 2 R VP OUT, 3 HCLR OUT, 4 CLK OUT, 5 GROUND
F
CN8: 1 FREEZE IN, 2 RF OUT, 3 M1 IN, 4 M2 IN, 5 M3 IN, 6 STILL-L IN
CN7: 1 SYNC OUT, 2 GROUND
CN6: 1 VIDEO 1 OUT, 2 GROUND, 3 VIDEO 2 OUT, 4 GROUND
G
CN5: 1 G LED OUT, 2 R LED OUT
CN4: 1 R SYNC OUT, 2 R VP OUT, 3 R WHD OUT, 4 RCBLK OUT, 5 R. BFP OUT, 6 R-Y SC OUT, 7 GROUND, 8 B-Y SC OUT, 9 GROUND, 10 INSEL 1 IN, 11 INSEL 2 IN
SWITCH BOARD
E3: 1 KEYSW 4 OUT, 2 KEYSW 2 OUT, 3 KEYDRV 5 OUT, 4 LEDDRV 5 OUT, 5 KEYDRV 4 OUT, 6 LEDDRV 4 OUT, 7 +5V IN
E2: 1 KEYDRV 3 OUT, 2 LEDDRV 3 OUT, 3 KEYDRV 2 OUT, 4 LEDDRV 2 OUT, 5 KEYDRV 1 OUT, 6 LEDDRV 1 OUT, 7 KEYDRV 0 OUT, 8 LEDDRV 0 OUT
E1: 1 +5V IN, 2 GROUND, 3 WHD IN, 4 VP IN, 5 SERIAL CLOCK OUT, 6 ACK DATA IN, 7 SERIAL DATA OUT, 8 RESET IN
E
CN1: 12 T F/OUT IN, 11 T F/IN IN, 10 V F/OUT IN, 9 V F/IN IN, 8 WIPE B IN, 7 WIPE A IN, 6 BSEL 2 IN, 5 BSEL 1 IN, 4 ASEL 2 IN, 3 ASEL 1 IN, 2 SISEL 2 IN, 1 SISEL 1 IN
1 A F/IN IN
E5: 1 RF IN, 2 M1 OUT, 3 M2 OUT, 4 M3 OUT, 5 FREEZE OUT, 6 STILL-L OUT
E4: 1 R SYNC IN, 2 R VP IN, 3 R WHD IN, 4 RCBLK IN, 5 R.BFP IN, 6 R-Y SC IN, 7 GROUND, 8 B-Y SC IN, 9 GROUND, 10 INSEL 1 OUT, 11 INSEL 2 OUT
B
E3: 1 BLACK OUT, 2 WHITE OUT, 3 GROUND, 4 BACK COLOR OUT, 5 R. BFP OUT, 6 R SYNC OUT, 7 GROUND, 8 MASK PULSE OUT
A
E7: 1 T. NORM OUT, 2 T. BORD OUT, 3 T. EDGE OUT, 4 REV OUT, 5 WCHR IN, 6 GROUND
D
E2: 1 TCL 2 OUT, 2 FCL 2 OUT, 3 FCL 1 OUT, 4 OUT EFF OUT, 5 OUT 2 OUT, 6 OUT 1 OUT, 7 F OUT IN, 8 F IN IN, 9 B ON IN, 10 A ON IN, 11 A.F/IN OUT
E
E1: 1 T F/OUT OUT, 2 T F/IN OUT, 3 V F/OUT OUT, 4 V F/IN OUT, 5 WIPE B OUT, 6 WIPE A OUT, 7 B SEL 2 OUT, 8 B SEL 1 OUT, 9 A SEL 2 OUT, 10 A SEL 1 OUT, 11 SISEL 2 OUT, 12 SISEL 1 OUT
CN1: 8 RESET OUT, 7 SERIAL DATA OUT, 6 ACK DATA OUT, 5 SERIAL CLK OUT, 4 VP OUT, 3 WHD OUT, 2 GROUND, 1 +5V OUT
CN4: 3 V. POS IN, 2 GROUND, 1 H. POS IN
E1: 1 2 3
POSITIONER BOARD
CN11: 3, 4 SOURCE 2L IN, 5 SOURCE 2R IN, 6 GROUND, 7 AUX L IN, 8 AUX R IN, 9 GROUND, 10 AUDIO L OUT, 11 AUDIO R OUT, 12 GROUND
CN12: 1 WIPE DC OUT, 2 GROUND, 3 +1.8V OUT, 4 +5V OUT, 5 +12V OUT
E6: 5 WIPE DC IN, 4 GROUND, 3 +1.8V IN, 2 +5V IN, 1 +12V IN
CONTROL BOARD
D-
NE
RD

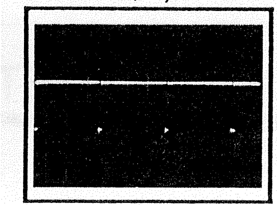
1. 0.5V/DIV, 10μs/DIV



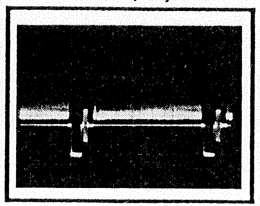
2. 0.5 V/DIV, 10μs/DIV



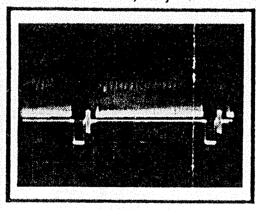
3. 2V/DIV, 20μs/DIV



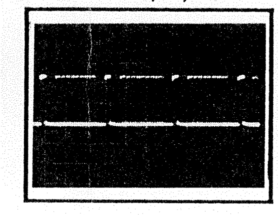
4. 0.2V/DIV, 10μs/DIV



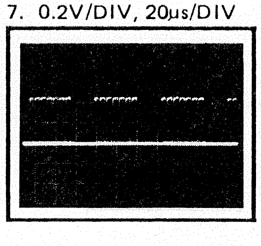
5. 0.5V/DIV, 10μs/DIV



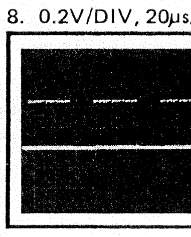
6. 0.2V/DIV, 20μs/DIV



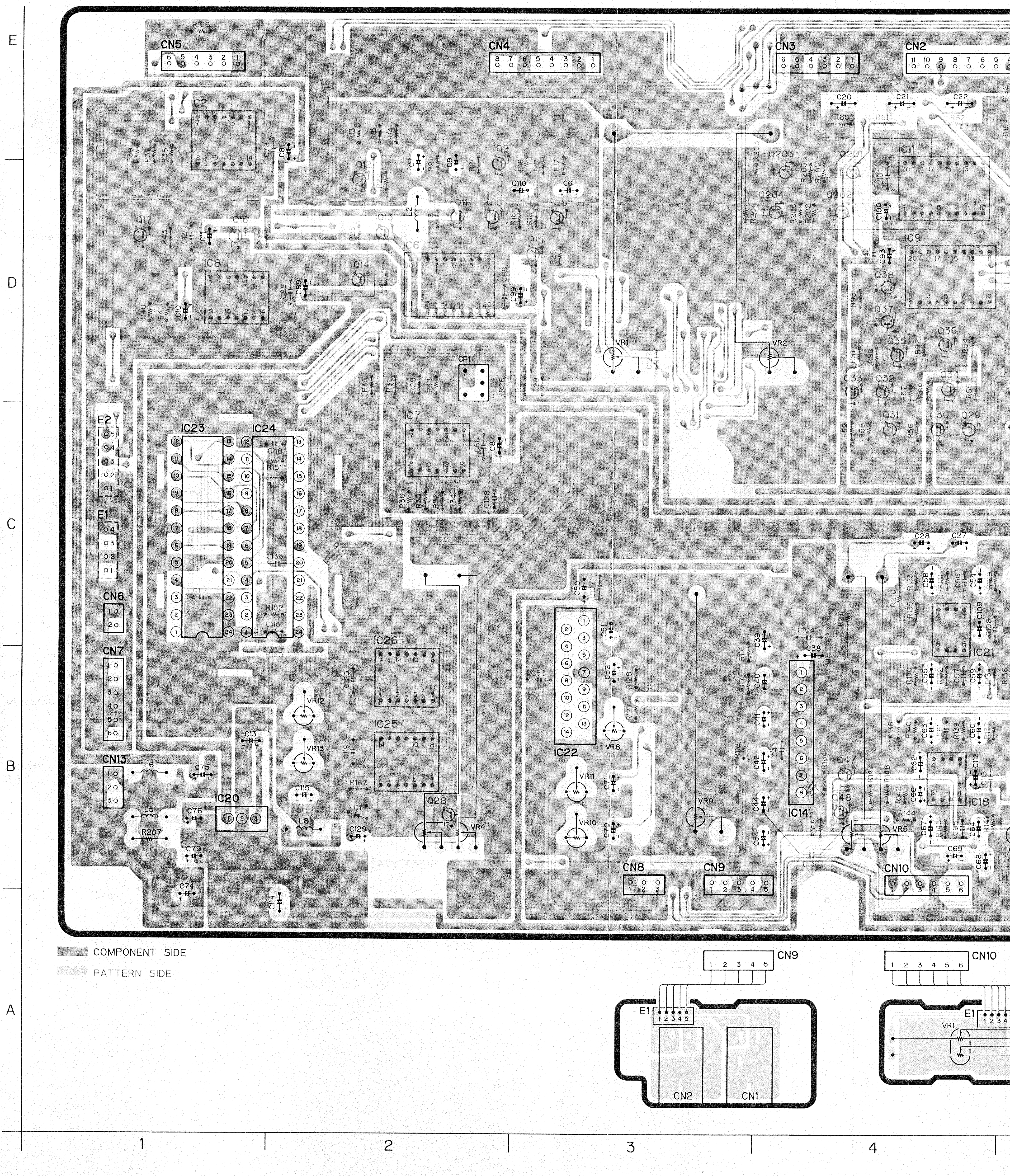
7. 0.2V/DIV, 20μs/DIV



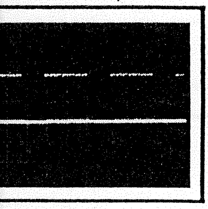
8. 0.2V/DIV, 20μs,



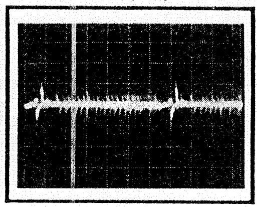
MIXER BOARD


E
D
C
B
A
1
2
3
4
CN5
CN4
CN3
CN2
CN6
CN7
CN8
CN9
CN10
CN13
E1
E2
IC2
IC6
IC7
IC8
IC9
IC11
IC14
IC18
IC20
IC21
IC22
IC23
IC24
IC25
IC26
CF1
VR1
VR2
VR4
VR5
VR8
VR9
VR10
VR11
VR12
VR13
L2
L5
L6
L8
R166
R207
COMPONENT SIDE
PATTERN SIDE
CN9
CN10
E1
CN2
CN1
VR1

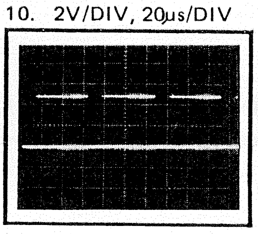
DUCTOR VIEW OF MIXER BOARD



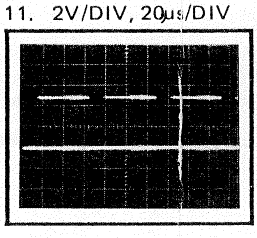
.2V/DIV, 20µs/DIV



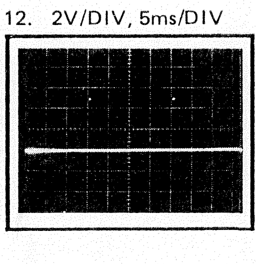
9. 0.1V/DIV, 10µs/DIV



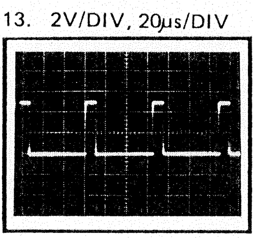
10. 2V/DIV, 20µs/DIV



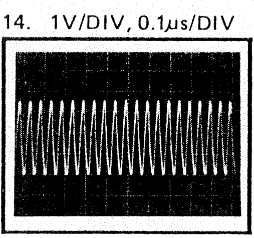
11. 2V/DIV, 20µs/DIV



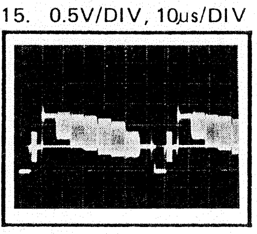
12. 2V/DIV, 5ms/DIV



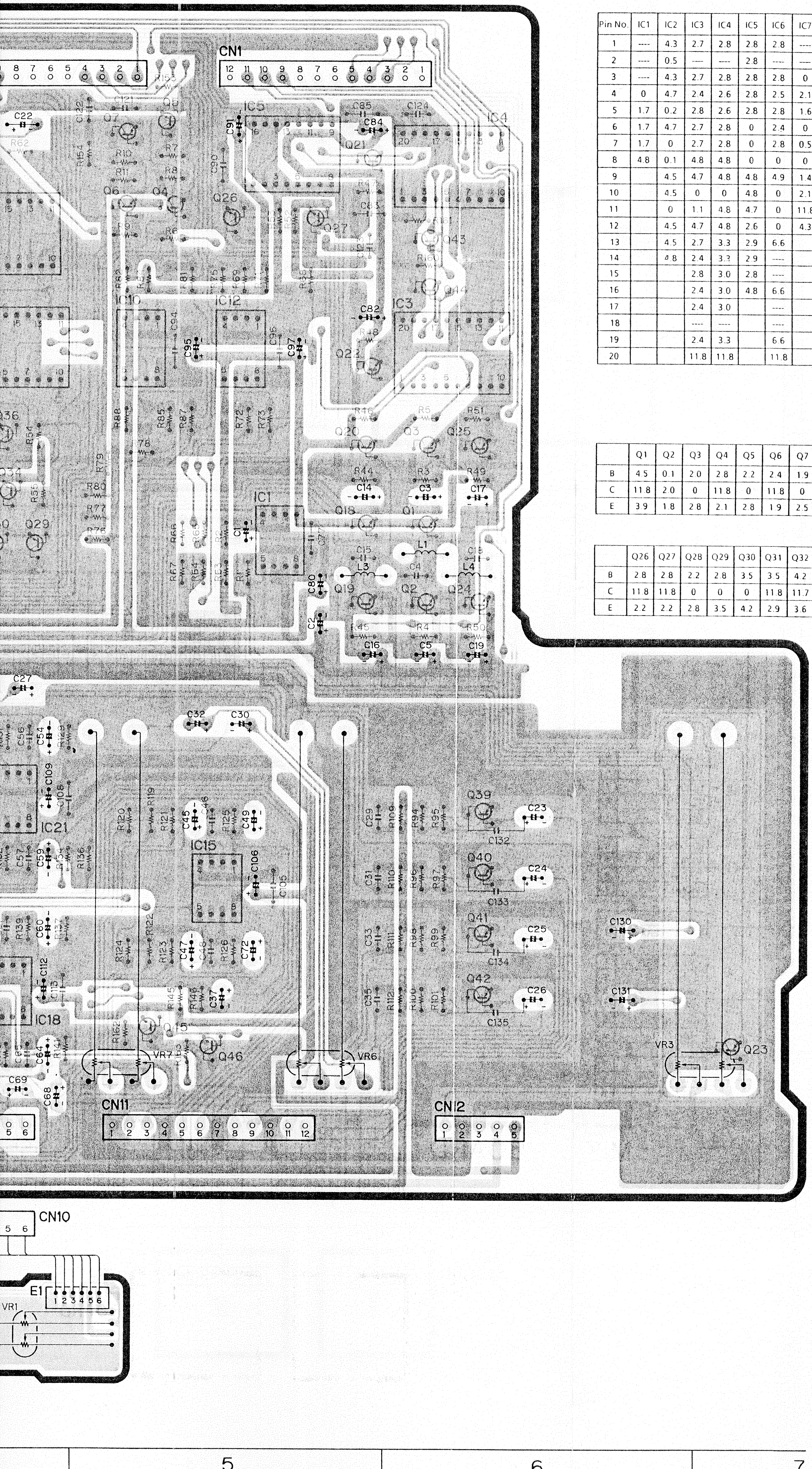
13. 2V/DIV, 20µs/DIV



14. 1V/DIV, 0.1µs/DIV



15. 0.5V/DIV, 10µs/DIV



Pin No.	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC14	IC15	IC18	IC20	IC21
1	----	4.3	2.7	2.8	2.8	2.8	----	----	2.8	4.8	2.6	0	11.8	6.2	6.2	11.8	6.2
2	----	0.5	----	----	2.8	----	----	----	----	6.5	----	4.5	0	6.2	6.2	0	6.3
3	----	4.3	2.7	2.8	2.8	2.8	0	0	2.8	6.6	2.6	3.2	0	6.2	6.2	9.0	6.2
4	0	4.7	2.4	2.6	2.8	2.5	2.1	1.6	----	0	2.6	0	1.3	0	0		0
5	1.7	0.2	2.8	2.6	2.8	2.8	1.6	2.8	----	0.6	3.3	1.4	1.8	6.2	6.2		6.2
6	1.7	4.7	2.7	2.8	0	2.4	0	0	2.5	6.6	2.6	3.2	2.1	6.2	6.2		6.2
7	1.7	0	2.7	2.8	0	2.8	0.5	----	2.8	0	2.8	0	0	6.2	6.2		6.2
8	4.8	0.1	4.8	4.8	0	0	0	0	0	11.8	0	11.8	0	11.8	11.8		11.8
9		4.5	4.7	4.8	4.8	4.9	1.4	----	0		0						
10		4.5	0	0	4.8	0	2.1	----	0		0						
11		0	1.1	4.8	4.7	0	11.8	11.8	4.9		----						
12		4.5	4.7	4.8	2.6	0	4.3	0.2	0		4.9						
13		4.5	2.7	3.3	2.9	6.6			2.8		----						
14		4.8	2.4	3.3	2.9	----			----		2.8						
15			2.8	3.0	2.8	----			----		3.3						
16			2.4	3.0	4.8	6.6			----		----						
17			2.4	3.0		----			----		2.8						
18			----	----		----			----		----						
19			2.4	3.3		6.6			2.8		----						
20			11.8	11.8		11.8			11.8		11.8						

Pin No.	IC22	IC23	IC24	IC25	IC26
1	11.8	----	0	4.8	0
2	3.2	----	0.1	4.7	4.7
3	2.8	----	----	0	4.7
4	6.4	0	0	----	4.7
5	7.1	0	0	0	4.7
6	6.4	3.2	0	----	0
7	0	0	0	0	0
8	6.6	1.8	0	4.7	4.7
9	----	0	0	4.3	0
10	2.8	0	1.8	0	0
11	----	0	----	4.7	0
12	----	0	0	0	4.7
13	2.8	0	0.4	4.8	4.7
14	3.1	0	----	4.8	4.8
15		0	0.7		
16		0	0		
17		1.8	0		
18		4.7	0		
19		3.2	5.0		
20		0	4.7		
21		0	0		
22		0	4.8		
23		0	4.8		
24		0	4.8		

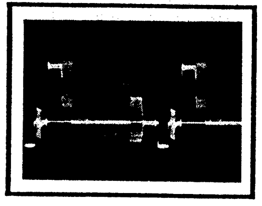
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25
B	4.5	0.1	2.0	2.8	2.2	2.4	1.9	2.8	2.8	9.3	0.1	1.7	2.4	1.8	2.8	0.1	0	4.2	0.1	1.7	3.3	3.0	2.8	0.1	2.0
C	11.8	2.0	0	11.8	0	11.8	0	11.8	9.3	11.8	1.7	0	11.8	0	11.8	1.6	1.8	11.8	1.4	0	11.8	11.8	0	2.0	0
E	3.9	1.8	2.8	2.1	2.8	1.9	2.5	2.2	2.2	8.7	1.8	2.4	1.8	2.4	2.2	1.8	0	3.6	1.8	2.4	2.8	2.2	3.5	1.8	2.8

	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48
B	2.8	2.8	2.2	2.8	3.5	3.5	4.2	2.9	2.8	3.5	3.5	4.2	2.9	5.8	5.7	5.7	5.7	2.4	2.7	0	0	0	0
C	11.8	11.8	0	0	0	11.8	11.7	0	0	0	11.8	11.7	0	0	0	0	0	0	0	0	0	3.9	3.7
E	2.2	2.2	2.8	3.5	4.2	2.9	3.6	3.6	3.5	4.2	2.9	3.6	3.6	6.4	6.3	6.3	6.3	3.0	3.3	0	0	0	0

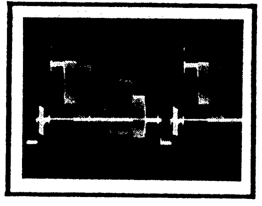
MIXER BOARD

IC1	NJM3414M		C5
IC2	MN74HC00S		E1
IC3	YWSC49069F		D6
IC4	YWSC49069F		E6
IC5	MN74HC4053S		E5
IC6	YWSC49069F		D2
IC7	NJM319M		C2
IC8	NJM319M		D1
IC9	YWSC49069F		D4
IC10	AN6914S		D5
IC11	YWSC49069F		D4
IC12	AN6914S		D5
IC14	YWM51304L		B4
IC15	NJM4559M		B5
IC18	YWM5216FP		B4
IC20	AN78L09		B1
IC21	NJM4559M		C4
IC22	YWM51523AL		B3
IC23	YWPD41102C1S		A1
IC24	YWPD65005232		A1
IC25	MN74HC86S		B2
IC26	MN74HC00S		B2
Q1	2SD601-RS	(Y)	D6
Q2	2SD601-RS	(Y)	C6
Q3	2SA1022-C	(E)	D6
Q4	2SD601-RS	(Y)	E5
Q5	2SB709-Q	(A)	E5
Q6	2SD601-RS	(Y)	E5
Q7	2SB709-Q	(A)	E5
Q8	2SD601-RS	(Y)	D3
Q9	2SC2404-CDTW	(U)	D3
Q10	2SD601-RS	(Y)	D3
Q11	2SD601-RS	(Y)	D2
Q12	2SA1022-C	(E)	D2
Q13	2SD601-RS	(Y)	D2
Q14	2SB709-Q	(A)	D2
Q15	2SD601-RS	(Y)	D3
Q16	2SD601-RS	(Y)	D1
Q17	2SD601-RS	(Y)	D1
Q18	2SD601-RS	(Y)	D5
Q19	2SD601-RS	(Y)	C5
Q20	2SA1022-C	(E)	D5
Q21	2SD601-RS	(Y)	E5
Q22	2SD601-RS	(Y)	D5
Q23	2SA1022-C	(E)	B7
Q24	2SD601-RS	(Y)	C6
Q25	2SA1022-C	(E)	D6
Q26	2SD601-RS	(Y)	D5
Q27	2SD601-RS	(Y)	D5
Q28	2SB709-Q	(A)	B2
Q29	2SA1022-C	(E)	C4
Q30	2SB709-Q	(A)	C4
Q31	2SD601-RS	(Y)	C4
Q32	2SD601-RS	(Y)	C4
Q33	2SB709-Q	(A)	C4
Q34	2SA1022-C	(E)	C4
Q35	2SB709-Q	(A)	D4
Q36	2SD601-RS	(Y)	D4
Q37	2SD601-RS	(Y)	D4
Q38	2SB709-Q	(A)	D4
Q39	2SB709-Q	(A)	B6
Q40	2SB709-Q	(A)	B6
Q41	2SB709-Q	(A)	B6
Q42	2SB709-Q	(A)	B6
Q43	2SB709-Q	(A)	D6
Q44	2SB709-Q	(A)	D6
Q45	2SD601-RS	(Y)	B5
Q46	2SD601-RS	(Y)	B5
Q47	2SD601-RS	(Y)	B4
Q48	2SD601-RS	(Y)	B4
Q201	2SD601-RS	(Y)	D4
Q202	2SD601-RS	(Y)	D4
Q203	2SB709-Q	(A)	D3
Q204	2SB709-Q	(A)	D3
D1	MA151K	(MH)	B2

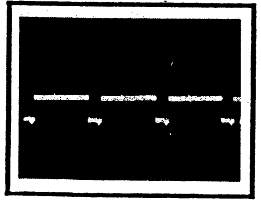
16. 50mV/DIV, 10μs/DIV



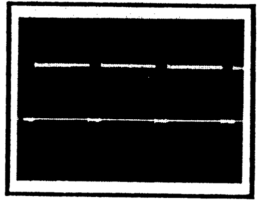
17. 50mV/DIV, 10μs/DIV



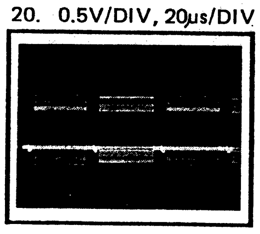
18 0.1V/DIV, 10μs/DIV



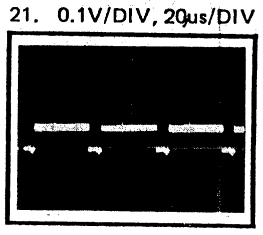
19. 0.5V/DIV, 20μs/DIV

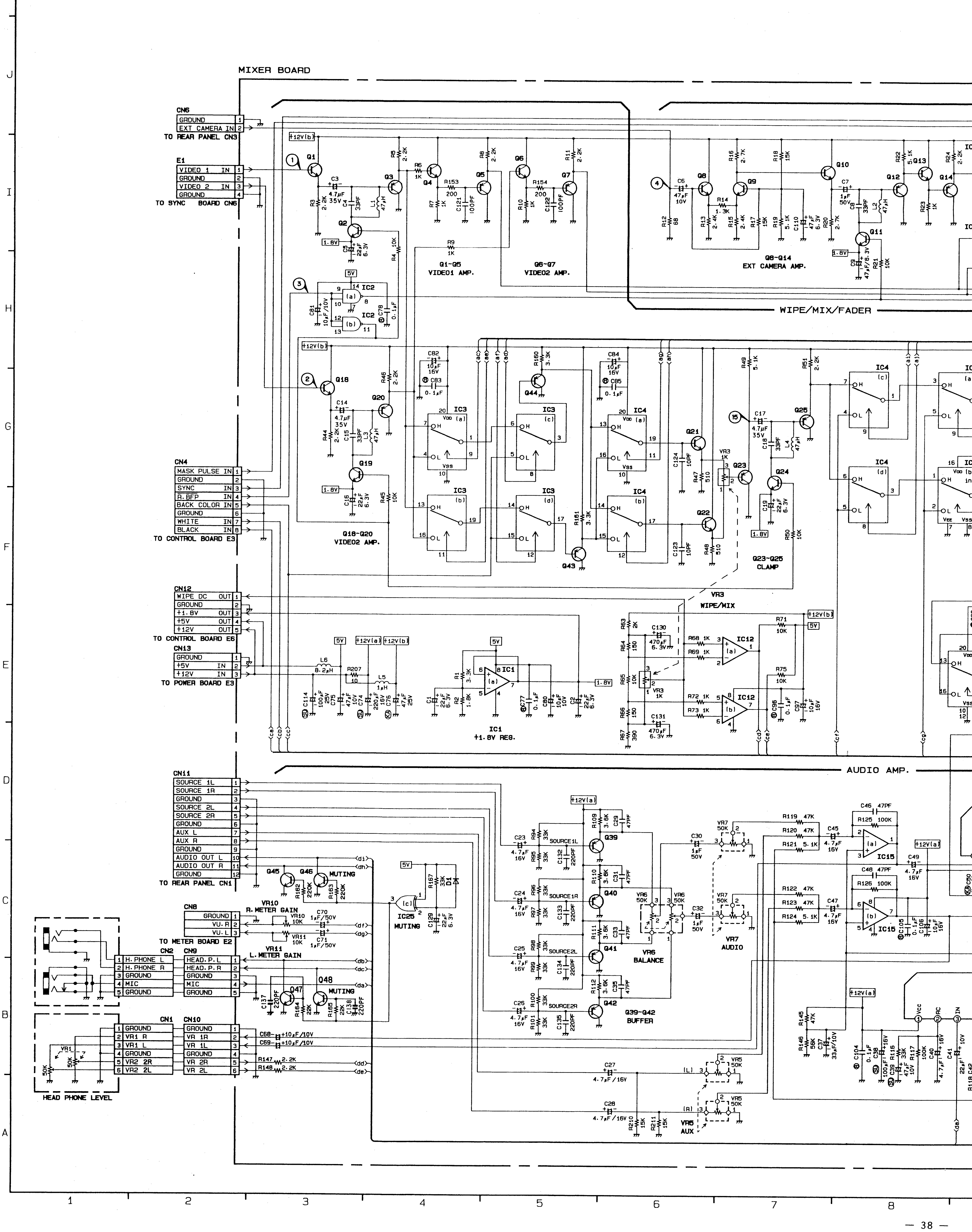


20. 0.5V/DIV, 20μs/DIV



21. 0.1V/DIV, 20μs/DIV

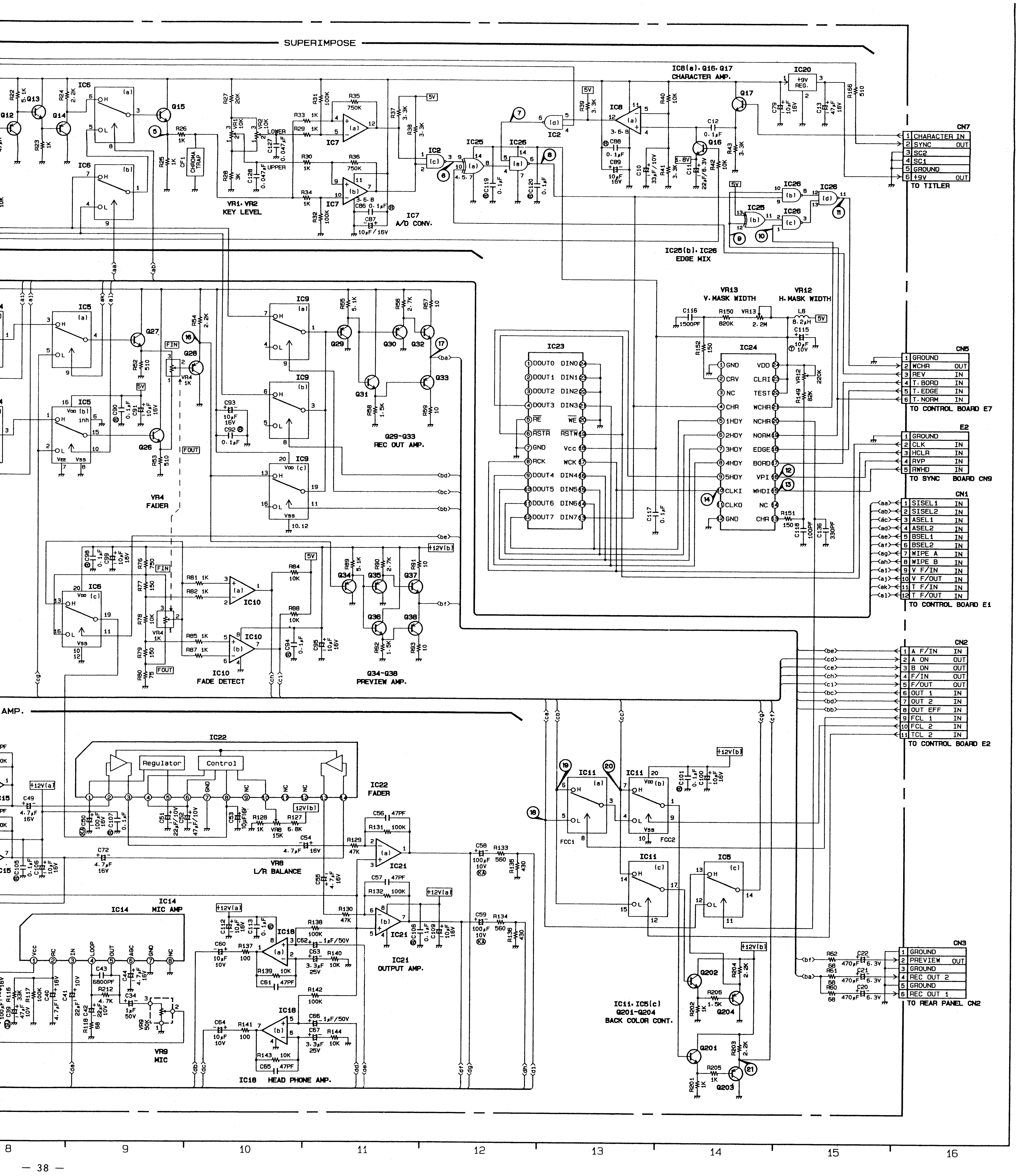




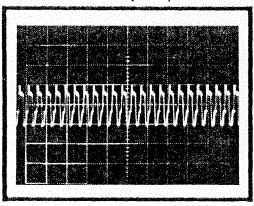
ATIC DIAGRAM OF MIXER BOARD

MIXER BOARD

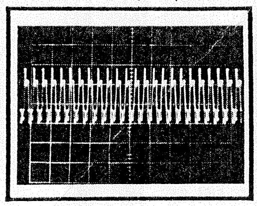
IC1	NJM3414M		E5
IC2	MN74HC00S		I 11, I 12, H3
IC3	YWSC49069F		G4, G5, F4, F5
IC4	YWSC49069F		G6, F6, G8, F8
IC5	MN74HC4053S		G8, H8, E8, C14
IC6	YWSC49069F		H9
IC7	NJM319M		H11
IC8	NJM319M		H13
IC9	YWSC49069F		G10, F9
IC10	AN6914S		E10
IC11	YWSC49069F		C13
IC12	AN6914S		E7
IC14	YWM51304L		B9
IC15	NJM4559M		B8, C8
IC18	YWM5216FP		A10, B10
IC20	AN78L09		I 14
IC21	NJM4559M		B11, C11
IC22	YWM51523AL		D10
IC23	YWPD41102C1S		G13
IC24	YWPD65005232		G14
IC25	MN74HC86S		I 12, I 14, C4
IC26	MN74HC00S		I 12, H14
Q1	2SD601-RS	(Y)	I 3
Q2	2SD601-RS	(Y)	I 3
Q3	2SA1022-C	(E)	I 4
Q4	2SD601-RS	(Y)	I 4
Q5	2SB709-Q	(A)	I 4
Q6	2SD601-RS	(Y)	I 5
Q7	2SB709-Q	(A)	I 5
Q8	2SD601-RS	(Y)	I 6
Q9	2SC2404-CDTW	(U)	I 6
Q10	2SD601-RS	(Y)	I 7
Q11	2SD601-RS	(Y)	I 8
Q12	2SA1022-C	(E)	I 8
Q13	2SD601-RS	(Y)	I 8
Q14	2SB709-Q	(A)	I 8
Q15	2SD601-RS	(Y)	I 9
Q16	2SD601-RS	(Y)	I 14
Q17	2SD601-RS	(Y)	I 14
Q18	2SD601-RS	(Y)	G3
Q19	2SD601-RS	(Y)	G3
Q20	2SA1022-C	(E)	G4
Q21	2SD601-RS	(Y)	G6
Q22	2SD601-RS	(Y)	F6
Q23	2SA1022-C	(E)	G7
Q24	2SD601-RS	(Y)	G7
Q25	2SA1022-C	(E)	G7
Q26	2SD601-RS	(Y)	G9
Q27	2SD601-RS	(Y)	G9
Q28	2SB709-Q	(A)	G10
Q29	2SA1022-C	(E)	G11
Q30	2SB709-Q	(A)	G11
Q31	2SD601-RS	(Y)	G11
Q32	2SD601-RS	(Y)	G11
Q33	2SB709-Q	(A)	G11
Q34	2SA1022-C	(E)	E11
Q35	2SB709-Q	(A)	E11
Q36	2SD601-RS	(Y)	E11
Q37	2SD601-RS	(Y)	E11
Q38	2SB709-Q	(A)	E11
Q39	2SB709-Q	(A)	D6
Q40	2SB709-Q	(A)	C6
Q41	2SB709-Q	(A)	C6
Q42	2SB709-Q	(A)	B6
Q43	2SB709-Q	(A)	F5
Q44	2SB709-Q	(A)	G5
Q45	2SD601-RS	(Y)	C3
Q46	2SD601-RS	(Y)	C3
Q47	2SD601-RS	(Y)	B3
Q48	2SD601-RS	(Y)	B3
Q201	2SD601-RS	(Y)	B14
Q202	2SD601-RS	(Y)	B14
Q203	2SB709-Q	(A)	B14
Q204	2SB709-Q	(A)	A14
D1	MA151K	(MH)	C4


SUPERIMPOSE
IC8(a)·Q16·Q17 CHARACTER AMP.
IC20 +9V REG.
CN7
1 CHARACTER IN
2 SYNC OUT
3 SC2
4 SC1
5 GROUND
6 +9V OUT
TO TITLER
VR1·VR2 KEY LEVEL
IC7 A/D CONV.
CHROMA TRAP
IC25(b)·IC26 EDGE MIX
VR13 V.MASK WIDTH
VR12 H.MASK WIDTH
IC23
IC24
CN5
1 GROUND
2 WCHR OUT
3 REV IN
4 T.BORD IN
5 T.EDGE IN
6 T.NORM IN
TO CONTROL BOARD E7
E2
1 GROUND
2 CLK IN
3 HCLR IN
4 RVP IN
5 RWHD IN
TO SYNC BOARD CN9
CN1
1 SISEL1 IN
2 SISEL2 IN
3 ASEL1 IN
4 ASEL2 IN
5 BSEL1 IN
6 BSEL2 IN
7 WIPE A IN
8 WIPE B IN
9 V F/IN IN
10 V F/OUT IN
11 T F/IN IN
12 T F/OUT IN
TO CONTROL BOARD E1
VR4 FADER
Q29-Q33 REC OUT AMP.
IC10 FADE DETECT
Q34-Q38 PREVIEW AMP.
AMP.
CN2
1 A F/IN IN
2 A ON OUT
3 B ON OUT
4 F/IN OUT
5 F/OUT OUT
6 OUT 1 IN
7 OUT 2 IN
8 OUT EFF IN
9 FCL 1 IN
10 FCL 2 IN
11 TCL 2 IN
TO CONTROL BOARD E2
IC22 FADER
Regulator
Control
VR8 L/R BALANCE
IC21 OUTPUT AMP.
IC14 MIC AMP
VR9 MIC
IC18 HEAD PHONE AMP.
IC11·IC5(c) Q201-Q204 BACK COLOR CONT.
CN3
1 GROUND
2 PREVIEW OUT
3 GROUND
4 REC OUT 2
5 GROUND
6 REC OUT 1
TO REAR PANEL CN2
8
9
10
11
12
13
14
15
16

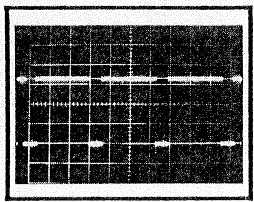
1. 0.5V/DIV, 0.5μs/DIV



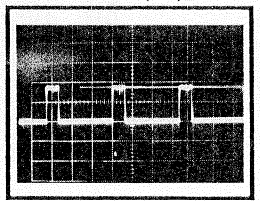
2. 0.5V/DIV, 0.5μs/DIV



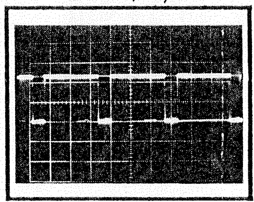
3. 0.5V/DIV, 20μs/DIV



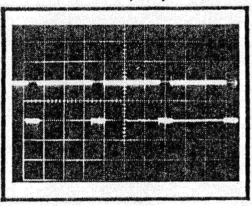
4. 50mV/DIV, 20μs/DIV



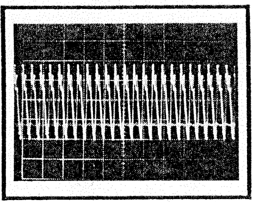
5. 0.1V/DIV, 20μs/DIV



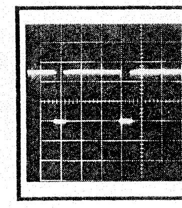
6. 0.2V/DIV, 20μs/DIV



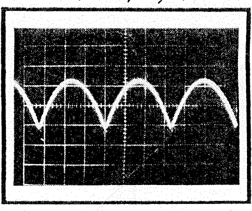
7. 0.5V/DIV, 0.5μs/DIV



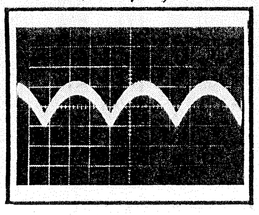
8. 2V/DIV, 20μs



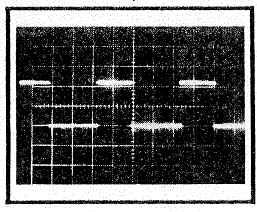
16. 1V/DIV, 20μs/DIV



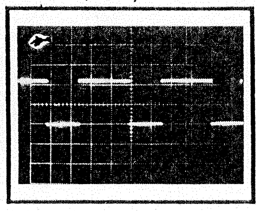
17. 1V/DIV, 20μs/DIV



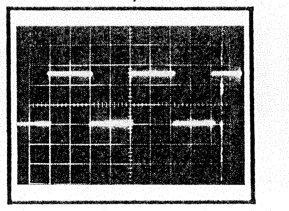
18. 2V/DIV, 5ms/DIV



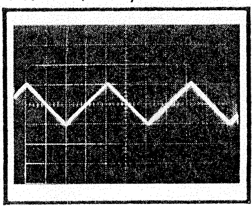
19. 2V/DIV, 5ms/DIV



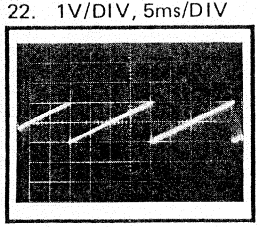
20. 1V/DIV, 5ms/DIV



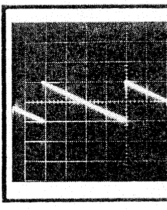
21. 1V/DIV, 5ms/DIV



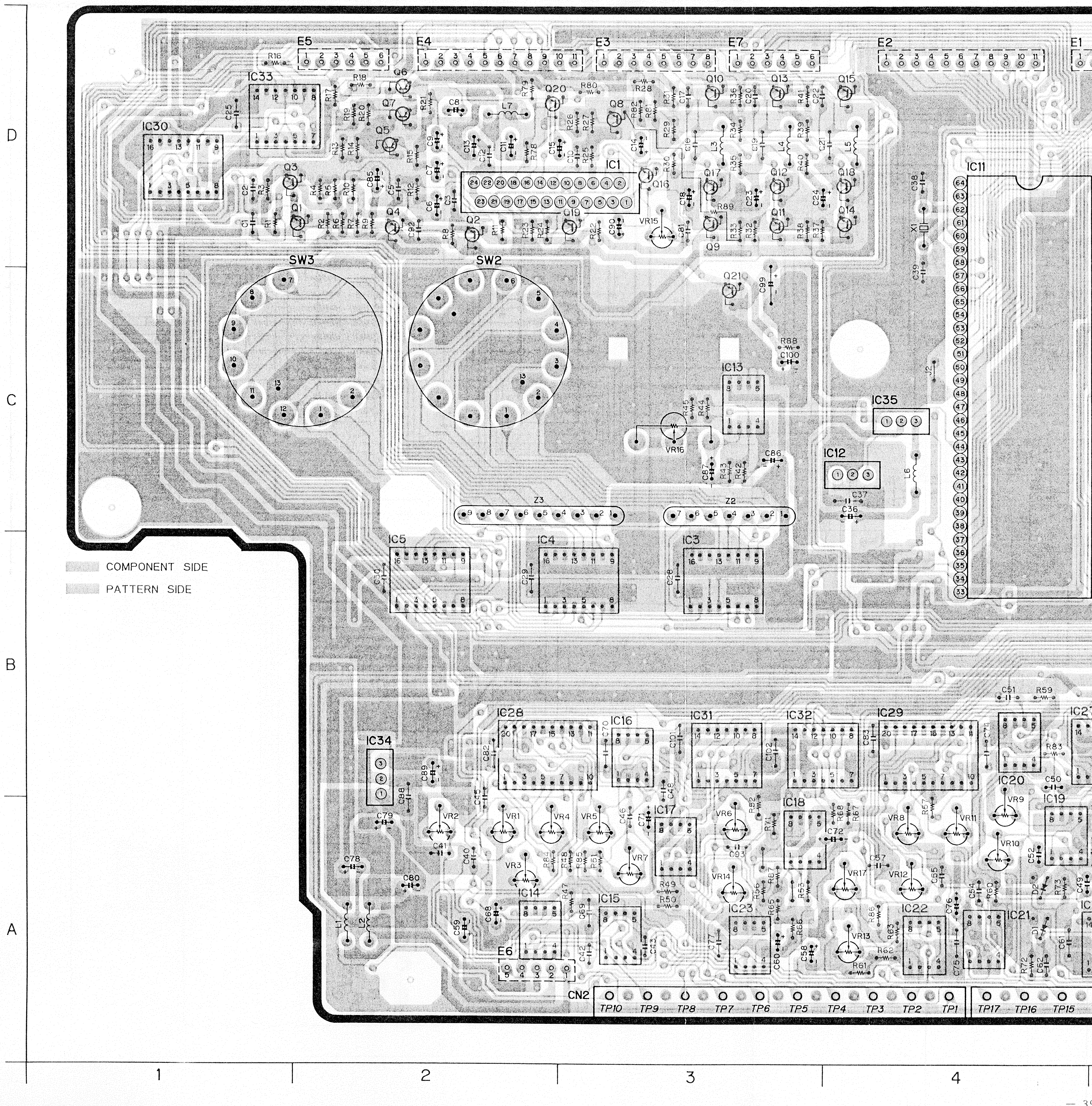
22. 1V/DIV, 5ms/DIV



23. 1V/DIV, 5m

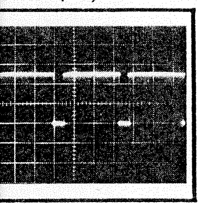


CONTROL BOARD

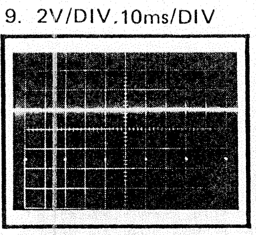

D
C
B
A
1
2
3
4
COMPONENT SIDE
PATTERN SIDE
E5
E4
E3
E7
E2
E1
IC33
IC30
IC1
IC11
IC13
IC35
IC12
IC5
IC4
IC3
IC28
IC16
IC31
IC32
IC29
IC34
IC17
IC18
IC20
IC19
IC14
IC15
IC23
IC22
IC21
E6
SW3
SW2
Z3
Z2
VR15
VR16
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
VR9
VR10
VR11
VR12
VR13
VR14
VR17
X1
L1
L2
L3
L4
L5
L6
L7
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
Q21
CN2
TP10
TP9
TP8
TP7
TP6
TP5
TP4
TP3
TP2
TP1
TP17
TP16
TP15

UCTOR VIEW OF CONTROL BOARD

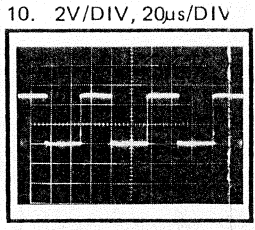
V/DIV, 20µs/DIV



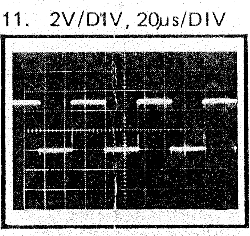
9. 2V/DIV.10ms/DIV



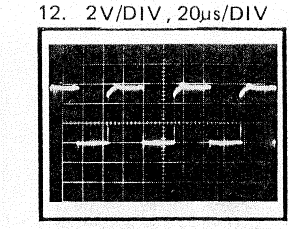
10. 2V/DIV, 20µs/DIV



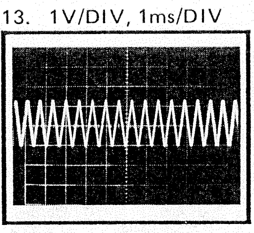
11. 2V/DIV, 20µs/DIV



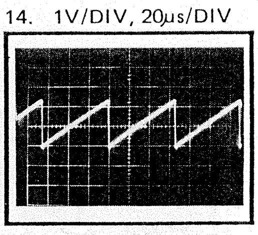
12. 2V/DIV, 20µs/DIV



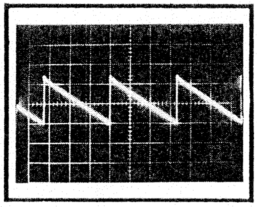
13. 1V/DIV, 1ms/DIV



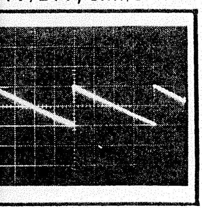
14. 1V/DIV, 20µs/DIV



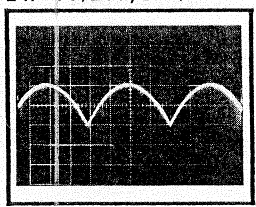
15. 1V/DIV, 20µs/DIV



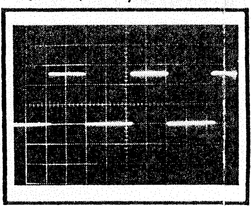
1V/DIV, 5ms/DIV



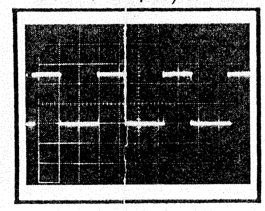
24. 1V/DIV, 5ms/DIV



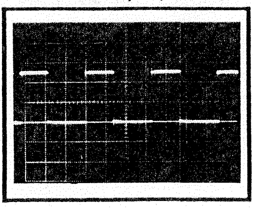
25. 2V/DIV, 5ms/DIV



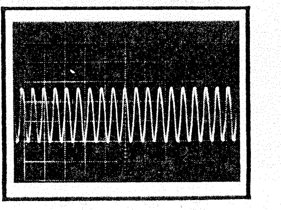
26. 2V/DIV, 20µs/DIV



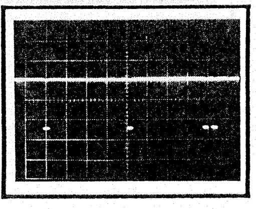
27. 2V/DIV, 20µs/DIV



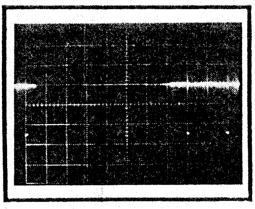
28. 2V/DIV, 0.5µs/DIV

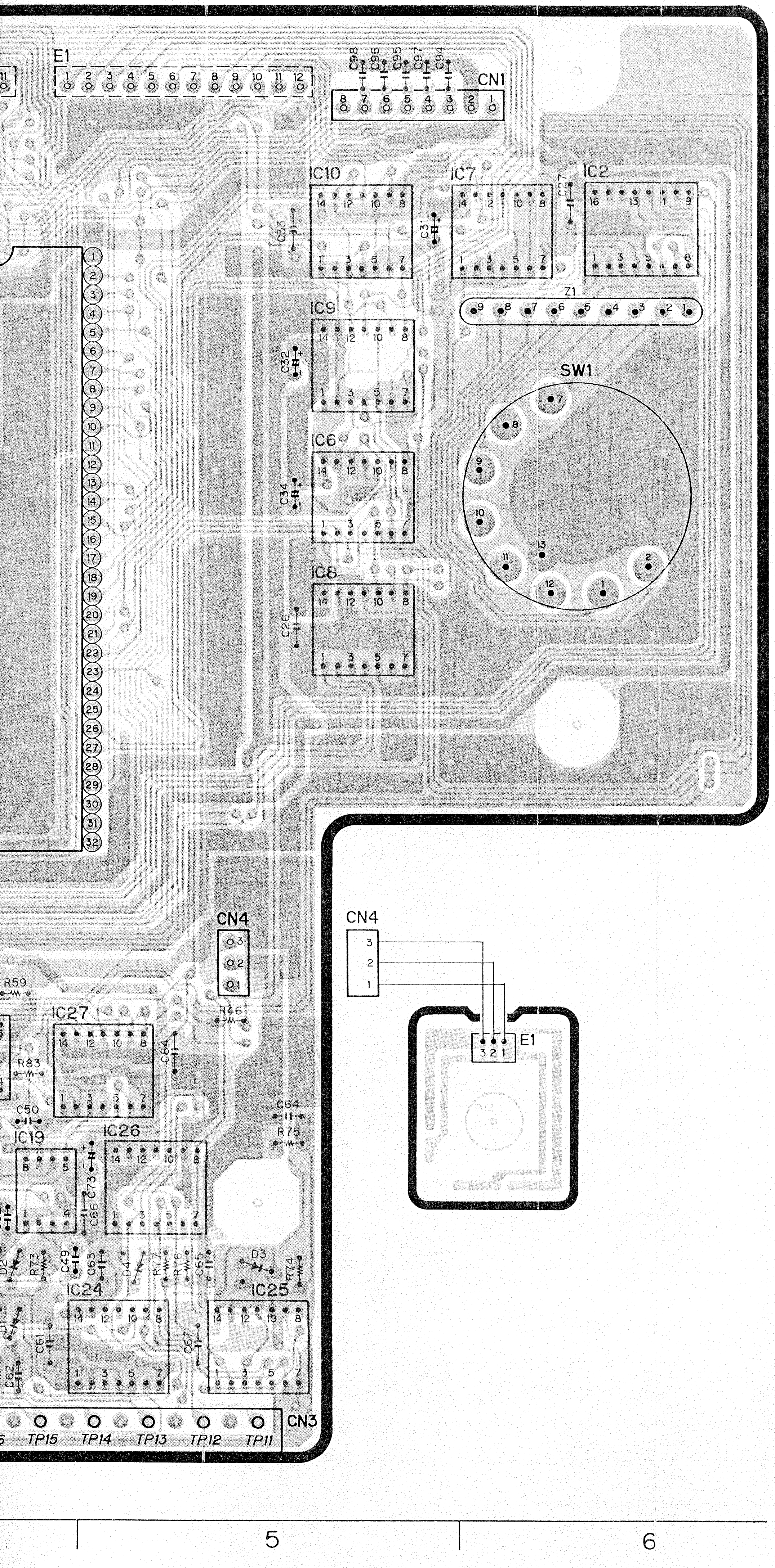


29. 2V/DIV, 1ms/DIV



30. 2V/DIV, 10ms/DIV





PinNo.	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC12	IC13	PinNo.	IC11	Pin No.	IC11	PinNo.	IC11
1	2.6	4.8	4.8	4.8	1.8	0	4.8	4.5	4.8	5.0	4.8	4.2	1	0	25	0	49	0
2	4.8	0	0	4.8	4.8	0	0	0.1	1.2	1.2	2	3.2	2	0	26	0	50	4.8
3	3.2	4.8	4.8	4.8	4.8	4.8	4.8	0	4.8	4.8	0	2.5	3	0	27	0	51	5.0
4	1.9	4.8	4.8	4.8	0	0	4.8	—	4.8	5.0		0	4	0	28	5.0	52	0
5	2.2	0	5.0	5.0	4.8	0	0	0	1.2	1.2		—	5	0	29	5.0	53	0
6	0	0	4.8	4.8	4.8	4.8	4.8	—	4.8	4.8		—	6	0	30	0	54	0
7	2.6	4.8	4.8	4.8	0	0	0	0	0	0		—	7	0	31	5.0	55	5.0
8	2.6	0	0	0	0	4.8	4.8	1.2	4.8	1.1		4.8	8	0	32	0	56	0
9	—	0	4.8	0	—	0	4.8	3.9	5.0	0			9	0	33	5.0	57	5.0
10	4.5	4.8	4.8	4.8	0	0	1.2	4.2	1.2	1.2			10	0	34	0	58	5.0
11	0	4.8	4.8	4.8	0	0	4.8	0	4.8	4.8			11	—	35	5.0	59	5.0
12	3.0	4.8	4.8	0	0	5.0	4.8	—	5.0	5.0			12	5.0	36	0	60	0
13	3.6	4.8	4.8	0	0	4.2	1.2	0	1.2	1.2			13	4.9	37	4.8	61	2.3
14	3.4	—	—	—	4.8	4.8	4.8	4.8	4.8	4.8			14	4.8	38	0	62	2.3
15	3.4	—	—	—	0								15	4.8	39	0	63	4.2
16	2.5	4.8	4.8	4.8	4.8								16	4.8	40	4.8	64	—
17	3.1												17	0	41	—		
18	3.4												18	5.0	42	—		
19	0												19	5.0	43	—		
20	3.0												20	0	44	4.2		
21	4.5												21	5.0	45	0		
22	0												22	5.0	46	0		
23	4.8												23	0	47	5.0		
24	4.8												24	4.1	48	0		

PinNo.	IC14	IC15	IC16	IC17	IC18	IC19	IC20	IC21	IC22	IC23	IC24	IC25	IC26	IC27	IC28	IC29	IC30
1	2.1	0	2.9	3.0	5.0	1.8	0	3.0	3.3	1.9	0	5.0	0	0	2.9	2.9	4.8
2	0.7	0.2	1.9	1.5	1.4	0.6	0.6	1.9	1.9	1.9	0	0	—	2.4	—	—	—
3	2.0	2.1	1.9	1.9	5.6	4.9	2.6	1.9	1.9	1.9	0	0	4.2	0	0.7	0.6	0
4	0	0	0	0	0	0	0	0	0	0	—	5.0	0	—	—	—	4.8
5	4.2	2.1	1.9	1.9	0	1.8	2.6	1.9	1.9	3.0	0	0	0	0.7	0.7	0.7	0
6	0.7	0.2	1.9	1.9	1.4	0	0.1	1.9	1.9	3.2	—	0	0	4.9	5.0	5.0	4.8
7	2.0	2.6	2.9	3.2	0	2.6	0	2.9	2.9	3.2	0	0	0	0	1.9	1.9	—
8	4.8	4.8	11.8	11.8	11.8	4.8	4.8	11.8	11.8	11.8	4.9	5.0	0	2.3	0	0	0
9											2.1	5.0	0	2.6	0	0	4.8
10											0	4.6	0	4.2	0	0	—
11											5.0	—	0	0.7	0	0	4.8
12											2.6	0	—	—	0	0	0
13											1.8	0	—	0	1.9	1.9	0
14											4.8	4.8	4.8	4.8	1.9	1.9	—
15															—	—	—
16															—	—	4.8
17															3.2	3.3	
18															—	—	
19															2.9	3.0	
20															11.8	11.8	

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
B	1.6	1.0	1.6	1.0	0.5	0	0	1.2	1.6	2.3	9.4	0.1	2.7	0	1.8	2.6	0.1
C	11.8	0	11.8	0	0	0	0	0	11.8	0	11.8	2.7	0	11.8	0	10.1	2.2
E	1.0	1.7	1.0	1.5	1.2	0.7	0.7	1.8	2.3	2.9	8.8	1.8	3.4	0	2.6	1.7	1.8

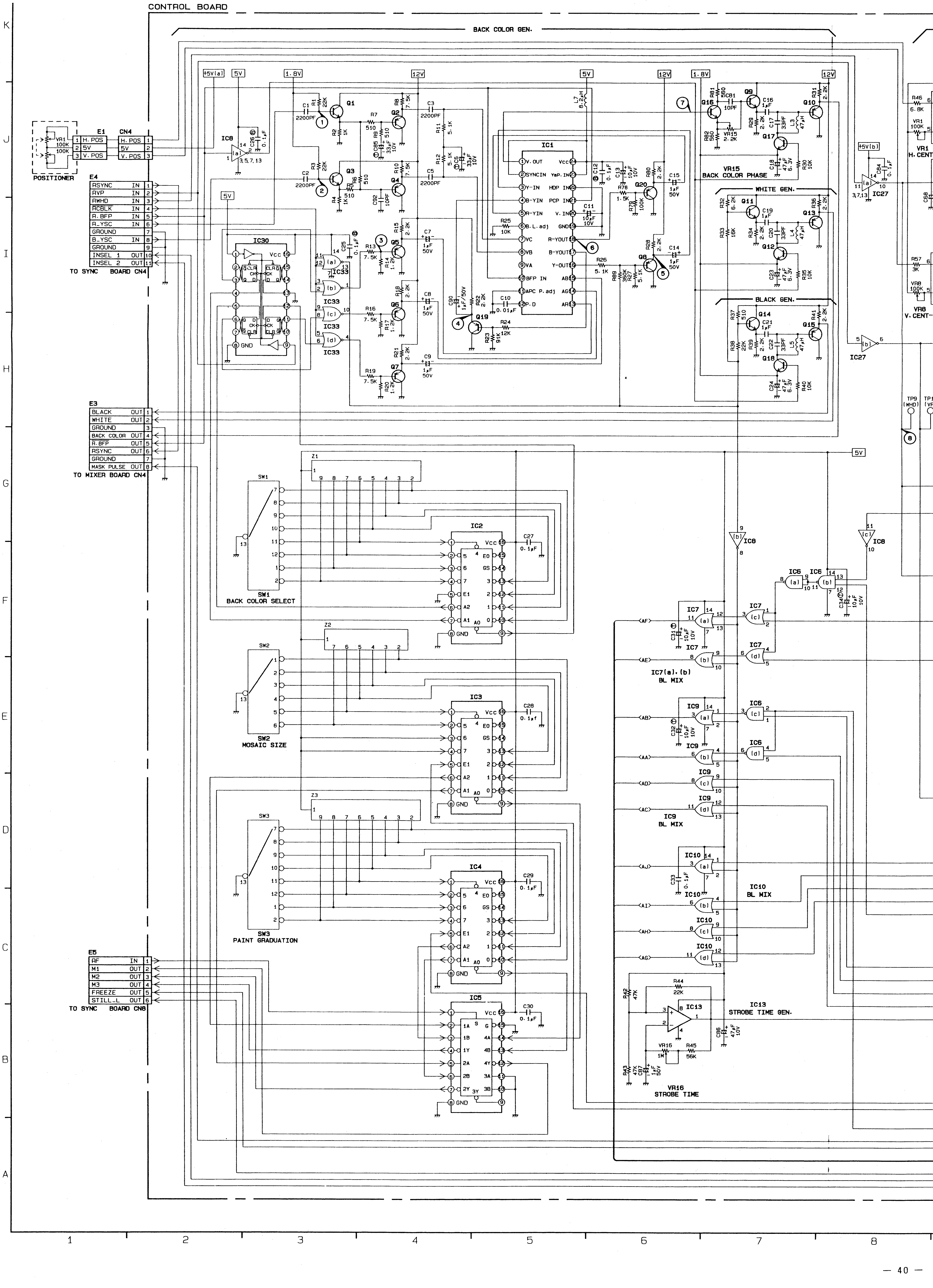
CONTROL BOARD

IC1	YWBA7230LS	D3	
IC2	MN74HC148S	D6	
IC3	MN74HC148S	B3	
IC4	MN74HC148S	B3	
IC5	MN74HC158S	B2	
IC6	MN74HC00S	C5	
IC7	MN74HC32S	D6	
IC8	MN74HC04S	C5	
IC9	MN74HC32S	C5	
IC10	MN74HC32S	D5	
IC11	MN1554CCD1	D4	
IC12	M51951ASL	C4	
IC13	NJM3414M	C3	
IC14	BA226AF	A2	
IC15	BA226AF	A3	
IC16	NJM4560M	B3	
IC17	NJM4560M	A3	
IC18	AN6914S	A3	
IC19	BA226AF	A4	
IC20	BA226AF	B4	
IC21	NJM4560M	A4	
IC22	NJM4560M	A4	
IC23	NJM4560M	A3	
IC24	MN74HC86S	A5	
IC25	MN74HC08S	A5	
IC26	MN4013BS	A5	
IC27	MN74HC04S	B5	
IC28	YWSC49069F	B2	
IC29	YWSC49069F	B4	
IC30	MN74HC175S	D1	
IC31	MN4066BS	B3	
IC32	MN4066BS	B4	
IC33	MN74HC02S	D1	
IC34	AN78L05	B2	
IC35	AN78L05	C4	
Q1	2SC2404-CDTW	(U)	D1
Q2	2SA1022-C	(E)	D2
Q3	2SC2404-CDTW	(U)	D1
Q4	2SA1022-C	(E)	D2
Q5	2SB709-Q	(A)	D2
Q6	2SB709-Q	(A)	D2
Q7	2SB709-Q	(A)	D2
Q8	2SB709-Q	(A)	D3
Q9	2SC2404-CDTW	(U)	D3
Q10	2SA1022-C	(E)	D3
Q11	2SD601-RS	(Y)	D3
Q12	2SD601-RS	(Y)	D3
Q13	2SB709-Q	(A)	D3
Q14	2SD601-RS	(Y)	D4
Q15	2SA1022-C	(E)	D4
Q16	2SC2404-CDTW	(U)	D3
Q17	2SD601-RS	(Y)	D3
Q18	2SD601-RS	(Y)	D4
Q19	2SB709-Q	(A)	D3
Q20	2SB709-Q	(A)	D2
Q21	2SB709-Q	(A)	C3
D1	MA151K	(MH)	A4
D2	MA151K	(MH)	A4
	MA151K	(MH)	A5
	MA151K	(MH)	A5

	Q18	Q19	Q20	Q21
B	0.1	2.7	3.4	11.0
C	1.8	0	0	11.8
E	1.8	3.6	4.1	11.7

PinNo.	IC31	IC32	IC33	IC34	IC35
1	5.6	0	3.5	11.8	11.7
2	2.9	0	0	0	0
3	2.9	2.9	1.2	4.8	4.8
4	5.6	0	0		
5	0	0	1.2		
6	0	0	4.8		
7	0	0	0		
8	5.6	0	4.8		
9	3.2	2.9	1.2		
10	3.0	3.0	0		
11	5.6	0	1.2		
12	0.1	0	1.2		
13	0	0	3.6		
14	4.8	4.8	4.8		

SCHEMATIC DIAGRAM OF CO


CONTROL BOARD
BACK COLOR GEN.
WHITE GEN.
BLACK GEN.
VR15 BACK COLOR PHASE
POSITIONER
VR1 100K
E1
CN4
H. POS
5V
V. POS
E4
RSYNC IN
RVP IN
RWHD IN
RCBLK IN
R. BFP IN
R_YSC IN
GROUND
B_YSC IN
INSEL 1 OUT
INSEL 2 OUT
TO SYNC BOARD CN4
E3
BLACK OUT
WHITE OUT
BACK COLOR OUT
R. BFP OUT
RSYNC OUT
MASK PULSE OUT
TO MIXER BOARD CN4
E5
AF IN
M1 OUT
M2 OUT
M3 OUT
FREEZE OUT
STILL_L OUT
TO SYNC BOARD CN8
IC1
V. OUT
SYNCIN
Y-IN
B-YIN
R-YIN
B. L. adj
VC
VB
VA
BFP IN
APC P. adj
P. D
Vcc
Y&P. IN
HDP IN
PCP IN
V. IN
GND
R-YOUT
B-YOUT
Y-OUT
AB
AG
AR
IC30
CLR
CK
Vcc
GND
IC33
IC8
IC2
IC3
IC4
IC5
IC27
IC6
IC7
IC9
IC10
IC13
SW1 BACK COLOR SELECT
SW2 MOSAIC SIZE
SW3 PAINT GRADUATION
Z1
Z2
Z3
EO
GS
E1
A2
A1
A0
1A
1B
1Y
2A
2B
2Y
3Y
3B
3A
4Y
4B
4A
IC7(a), (b) BL MIX
IC9 BL MIX
IC10 BL MIX
IC13 STROBE TIME GEN.
VR16 STROBE TIME
VR1 H. CENT
VR8 V. CENT
TP9 (WHD)
+5V(a)
+5V(b)
5V
12V
1.8V
AF
AE
AB
AA
AD
AC
AJ
AI
AH
AG
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
K
J
I
H
G
F
E
D
C
B
A
1
2
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4
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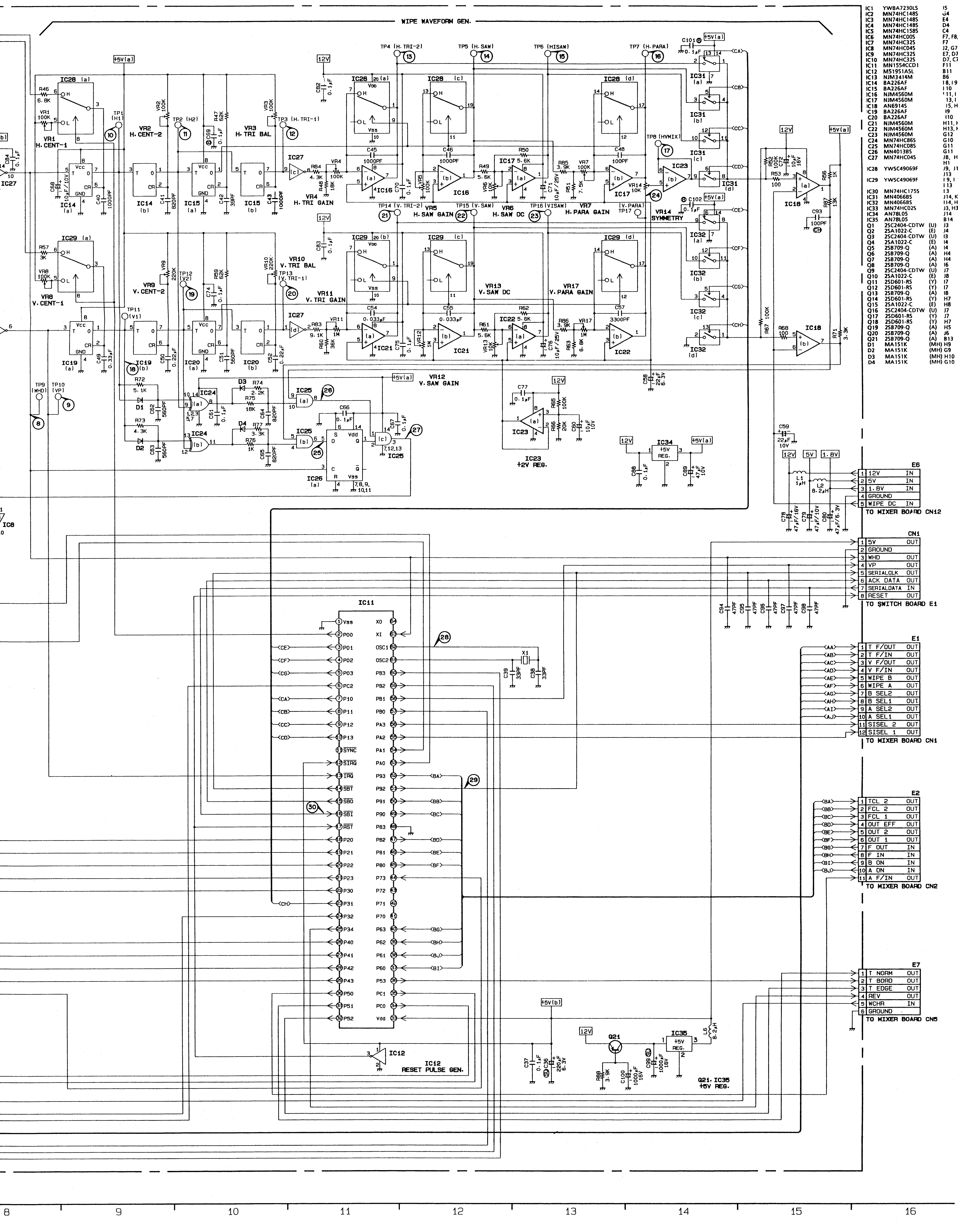
6
7
8

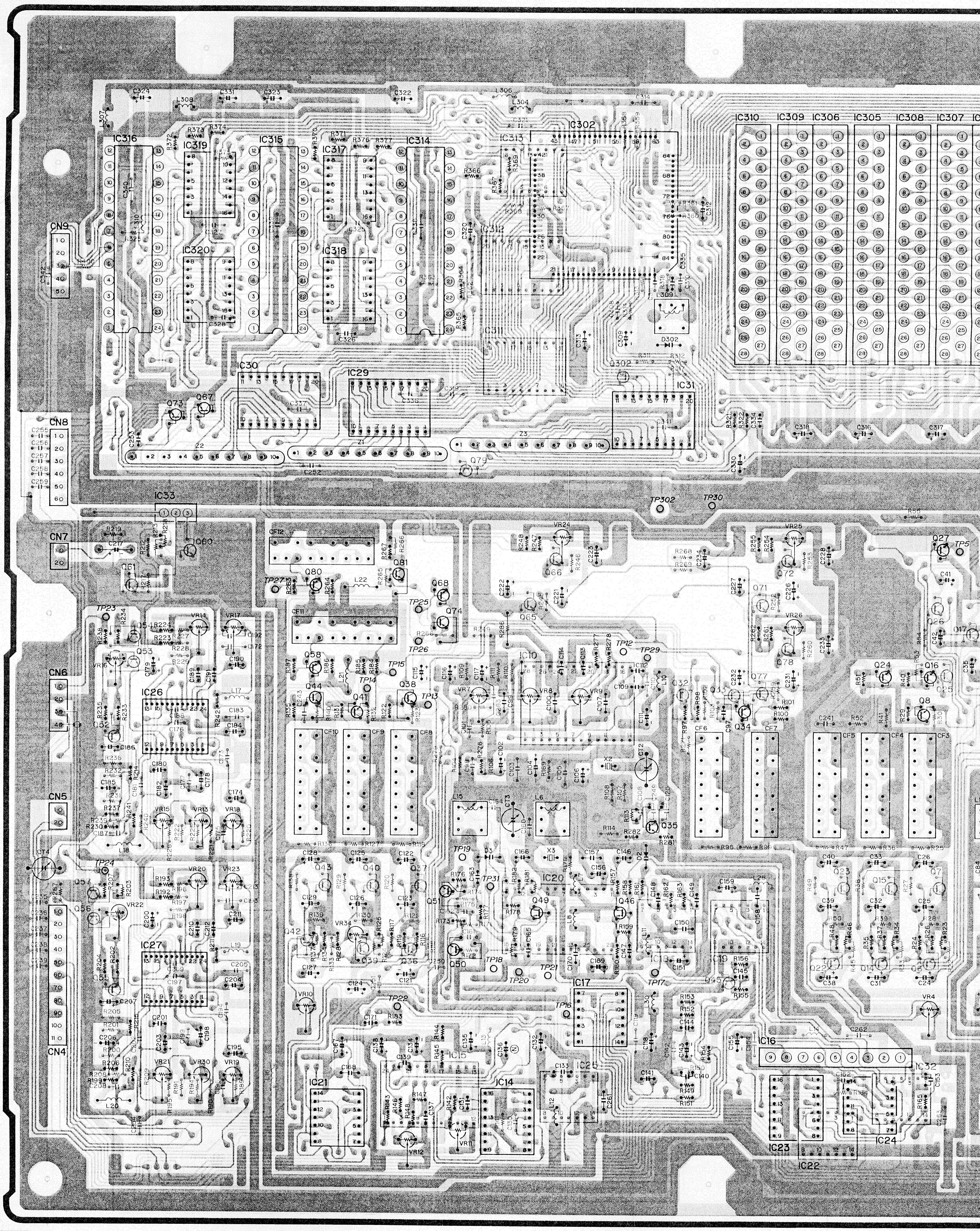
OF CONTROL BOARD


WIPE WAVEFORM GEN.
IC28 (a)
IC28 (b)
IC28 (c)
IC28 (d)
IC29 (a)
IC29 (b)
IC29 (c)
IC29 (d)
VR1 H. CENT-1
VR2 H. CENT-2
VR3 H. TRI BAL
VR4 H. TRI GAIN
VR5 H. SAW GAIN
VR6 H. SAW DC
VR7 H. PARA GAIN
VR8 V. CENT-1
VR9 V. CENT-2
VR10 V. TRI BAL
VR11 V. TRI GAIN
VR12 V. SAW GAIN
VR13 V. SAW DC
VR14 SYMMETRY
VR17 V. PARA GAIN
TP1 (H1)
TP2 (H2)
TP3 (H. TRI-1)
TP4 (H. TRI-2)
TP5 (H. SAW)
TP6 (HISAW)
TP7 (H. PARA)
TP8 (HVMIX)
TP9 (WHD)
TP10 (VP)
TP11 (V1)
TP12 (V2)
TP13 (V. TRI-1)
TP14 (V. TRI-2)
TP15 (V. SAW)
TP16 (VISAW)
TP17 (V. PARA)
IC14 (a)
IC14 (b)
IC15 (a)
IC15 (b)
IC16
IC17
IC18
IC19 (a)
IC19 (b)
IC20 (a)
IC20 (b)
IC21
IC22
IC23
IC24
IC25
IC26 (a)
IC27
IC31
IC32
IC23 +2V REG.
IC34 +5V REG.
IC11
IC12 RESET PULSE GEN.
Q21, IC35 +5V REG.
X1
E6
1 12V IN
2 5V IN
3 1.8V IN
4 GROUND
5 WIPE DC IN
TO MIXER BOARD CN12
CN1
1 5V OUT
2 GROUND
3 WHD OUT
4 VP OUT
5 SERIALCLK OUT
6 ACK DATA OUT
7 SERIALDATA IN
8 RESET OUT
TO SWITCH BOARD E1
E1
1 T F/OUT OUT
2 T F/IN OUT
3 V F/OUT OUT
4 V F/IN OUT
5 WIPE B OUT
6 WIPE A OUT
7 B SEL2 OUT
8 B SEL1 OUT
9 A SEL2 OUT
10 A SEL1 OUT
11 SISEL 2 OUT
12 SISEL 1 OUT
TO MIXER BOARD CN1
E2
1 TCL 2 OUT
2 FCL 2 OUT
3 FCL 1 OUT
4 OUT EFF OUT
5 OUT 2 OUT
6 OUT 1 OUT
7 F OUT IN
8 F IN IN
9 B ON IN
10 A ON IN
11 A F/IN OUT
TO MIXER BOARD CN2
E7
1 T NORM OUT
2 T BORD OUT
3 T EDGE OUT
4 REV OUT
5 WCHR IN
6 GROUND
TO MIXER BOARD CN5
8
9
10
11
12
13
14
15
16

IC1	YWBA7230LS		I5
IC2	MN74HC148S		G4
IC3	MN74HC148S		E4
IC4	MN74HC148S		D4
IC5	MN74HC158S		C4
IC6	MN74HC00S		F7, F8,
IC7	MN74HC32S		F7
IC8	MN74HC04S		J2, G7,
IC9	MN74HC32S		E7, D7
IC10	MN74HC32S		D7, C7
IC11	MN1554CCD1		F11
IC12	M51951ASL		B11
IC13	NJM3414M		B6
IC14	BA226AF		I8, I9
IC15	BA226AF		I10
IC16	NJM4560M		I11, I
IC17	NJM4560M		13, I
IC18	AN6914S		I5, H
IC19	BA226AF		I9
C20	BA226AF		I10
C21	NJM4560M		H11, H
C22	NJM4560M		H13, H
C23	NJM4560M		G12
C24	MN74HC86S		G10
C25	MN74HC08S		G11
C26	MN4013BS		G11
C27	MN74HC04S		J8, H H1
IC28	YWSC49069F		J9, J1 J13
IC29	YWSC49069F		I9, I I13
IC30	MN74HC175S		I3
IC31	MN4066BS		J14, K
IC32	MN4066BS		I14, H
IC33	MN74HC02S		J3, H3
IC34	AN78L05		J14
IC35	AN78L05		B14
Q1	2SC2404-CDTW	(U)	J3
Q2	2SA1022-C	(E)	J4
Q3	2SC2404-CDTW	(U)	I3
Q4	2SA1022-C	(E)	I4
Q5	2SB709-Q	(A)	I4
Q6	2SB709-Q	(A)	H4
Q7	2SB709-Q	(A)	H4
Q8	2SB709-Q	(A)	I6
Q9	2SC2404-CDTW	(U)	J7
Q10	2SA1022-C	(E)	J8
Q11	2SD601-RS	(Y)	I7
Q12	2SD601-RS	(Y)	I7
Q13	2SB709-Q	(A)	I8
Q14	2SD601-RS	(Y)	H7
Q15	2SA1022-C	(E)	H8
Q16	2SC2404-CDTW	(U)	J7
Q17	2SD601-RS	(Y)	J7
Q18	2SD601-RS	(Y)	H7
Q19	2SB709-Q	(A)	H5
Q20	2SB709-Q	(A)	J6
Q21	2SB709-Q	(A)	B13
D1	MA151K	(MH)	H9
D2	MA151K	(MH)	G9
D3	MA151K	(MH)	H10
D4	MA151K	(MH)	G10

CONDUCTOR VIEW OF

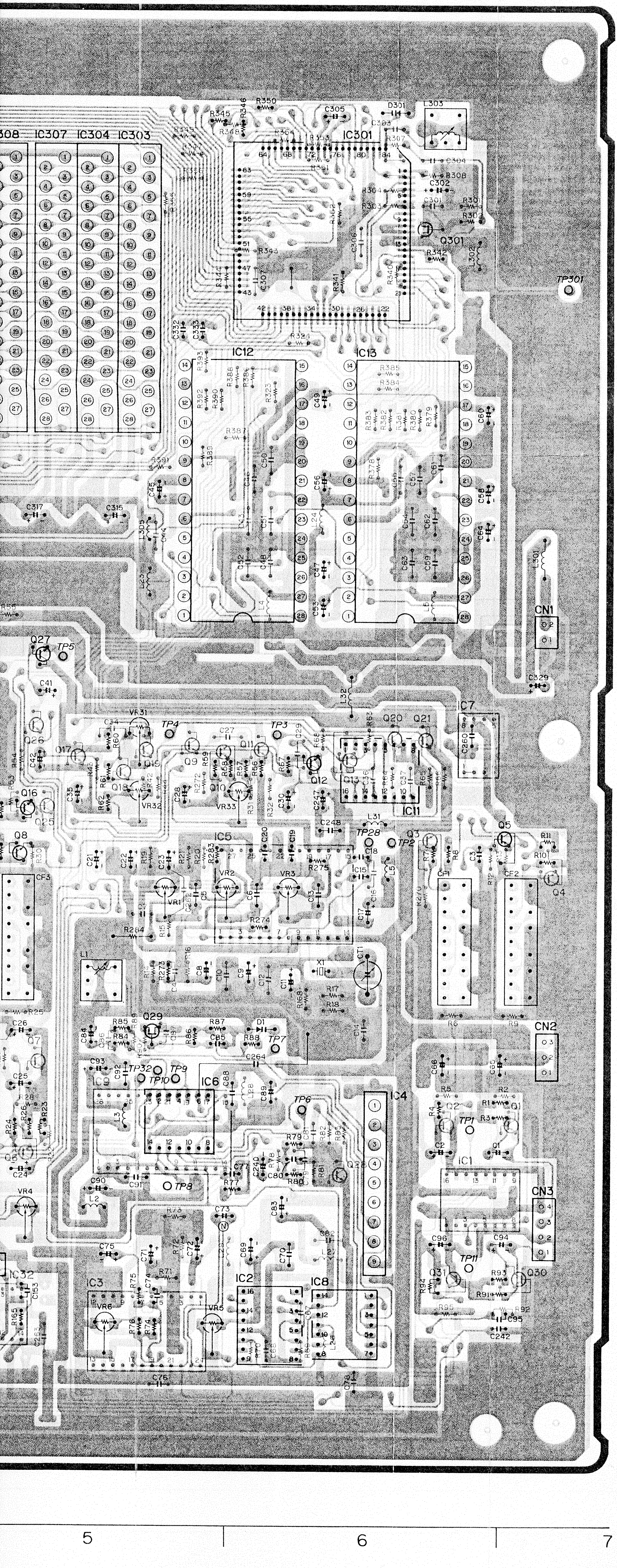
SYNC BOARD


F
E
D
C
B
A
1
2
3
4
5
IC316
IC319
IC315
IC317
IC314
IC313
IC302
IC312
IC311
IC320
IC318
IC30
IC29
IC31
IC310
IC309
IC306
IC305
IC308
IC307
IC33
IC10
IC26
IC27
IC20
IC17
IC15
IC14
IC21
IC25
IC16
IC32
IC23
IC22
IC24
CN9
CN8
CN7
CN6
CN5
CN4
CF12
CF11
CF10
CF9
CF8
CF7
CF6
CF5
CF4
CF3
Z1
Z2
Z3
X2
X3
D302
L309
Q302
TP302
TP30
TP27
TP25
TP26
TP23
TP24
TP15
TP14
TP13
TP12
TP29
TP19
TP31
TP18
TP20
TP21
TP17
TP16
TP22
TP5
VR14
VR17
VR16
VR15
VR13
VR18
VR20
VR23
VR22
VR21
VR30
VR19
VR10
VR12
VR11
VR24
VR25
VR26
VR7
VR8
VR9
VR34
VR4

▨ COMPONENT SIDE

▨ PATTERN SIDE

VIEW OF SYNC BOARD

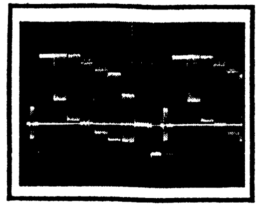


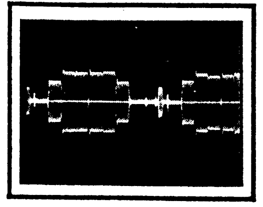
SYNC BOARD

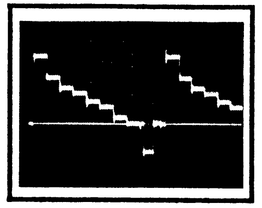
IC1	MN74HC4053S		B6
IC2	MN4528BS		A6
IC3	AN2510S		A5
IC4	TC5081AP		B6
IC5	YWM51271FP		C6
IC6	MN74HC04S		B5
IC7	NJM3414M		C6
IC8	MN74HC00S		A6
IC9	MN676021PPS		B5
IC10	YWM51271FP		C3
IC11	MN74HC4053S		C6
IC12	MP7684		E5
IC13	MP7684		E6
IC14	MN4528BS		A3
IC15	AN2510S		A3
IC16	TC5081AP		A4
IC17	MN74HC04S		B3
IC18	MN74HC00S		B4
IC19	MN74HC08S		B4
IC20	MN676021PPS		B3
IC21	MN74HC04S		A2
IC22	MN74HC393S		A4
IC23	MN4528BS		A4
IC24	MN74HC74S		A4
IC25	MN74HC74S		A3
IC26	YWM51272FP		C1
IC27	YWM51272FP		B1
IC29	MN74HC245S		D2
IC30	MN74HC245S		D2
IC31	MN74HC245S		D4
IC32	MN74HC86S		A5
IC33	AN78L05		D1
IC301	MN51010LVJ		E6
IC302	MN51015LVK		E4
IC303	YWM5M4C500L		E5
IC304	YWM5M4C500L		E5
IC305	YWM5M4C500L		E5
IC306	YWM5M4C500L		E4
IC307	YWM5M4C500L		E5
IC308	YWM5M4C500L		E5
IC309	YWM5M4C500L		E4
IC310	YWM5M4C500L		E4
IC311	MN74HC273S		D3
IC312	MN74HC273S		E3
IC313	MN74HC157S		E3
IC314	YWPD41102C1S		E3
IC315	YWPD41102C1S		E2
IC316	YWPD41102C1S		E1
IC317	MN74HC153S		E2
IC318	MN74HC153S		E2
IC319	MN74HC153S		E2
IC320	MN74HC153S		E2
Q1	2SB709-Q	(A)	B7
Q2	2SD601-RS	(Y)	B6
Q3	2SB709-Q	(A)	C6
Q4	2SB709-Q	(A)	C7
Q5	2SB709-Q	(A)	C7
Q6	2SD601-RS	(Y)	B5
Q7	2SD601-RS	(Y)	B5
Q8	2SD601-RS	(Y)	C5
Q9	2SD601-RS	(Y)	C5
Q10	2SD601-RS	(Y)	C5
Q11	2SD601-RS	(Y)	C6
Q12	2SD601-RS	(Y)	C6
Q13	2SD601-RS	(Y)	C6
Q14	2SD601-RS	(Y)	B5
Q15	2SD601-RS	(Y)	B5
Q16	2SD601-RS	(Y)	C5
Q17	2SD601-RS	(Y)	C5
Q18	2SD601-RS	(Y)	C5
Q19	2SD601-RS	(Y)	C5
Q20	2SD601-RS	(Y)	C6
Q21	2SD601-RS	(Y)	C6
Q22	2SD601-RS	(Y)	B4
Q23	2SD601-RS	(Y)	B4
Q24	2SD601-RS	(Y)	C5
Q25	2SD601-RS	(Y)	C5
Q26	2SD601-RS	(Y)	C5
Q27	2SD601-RS	(Y)	D5
Q28	2SD601-RS	(Y)	B6
Q29	2SK198-Q	(1O)	B5
Q30	2SB709-Q	(A)	A7
Q31	2SD601-RS	(Y)	A6
Q32	2SB709-Q	(A)	C4
Q33	2SB709-Q	(A)	C4
Q34	2SB709-Q	(A)	C4
Q35	2SC2404-CDTW	(U)	C3
Q36	2SD601-RS	(Y)	B2
Q37	2SD601-RS	(Y)	B2
Q38	2SD601-RS	(Y)	C2
Q39	2SD601-RS	(Y)	B2
Q40	2SD601-RS	(Y)	B2
Q41	2SD601-RS	(Y)	C2
Q42	2SD601-RS	(Y)	B2
Q43	2SD601-RS	(Y)	B2
Q44	2SD601-RS	(Y)	C2
Q45	2SD601-RS	(Y)	B4
Q46	2SK198-Q	(1O)	B3
Q49	2SK198-Q	(1O)	B3
Q50	2SC2404-CDTW	(U)	B3
Q51	2SC2404-CDTW	(U)	B3
Q52	2SC2404-CDTW	(U)	C1
Q53	2SC2404-CDTW	(U)	C1
Q54	2SC2404-CDTW	(U)	C1
Q55	2SC2404-CDTW	(U)	B1
Q56	2SC2404-CDTW	(U)	B1
Q57	2SC2404-CDTW	(U)	B1
Q58	2SB709-Q	(A)	C2
Q60	2SD601-RS	(Y)	D1
Q61	2SD602-QRS	(W)	C1
Q65	2SD601-RS	(Y)	C3
Q66	2SD601-RS	(Y)	D3
Q67	2SB709-Q	(A)	D1
Q68	2SB709-Q	(A)	C3
Q71	2D601-RS	(Y)	C4
Q72	2D601-RS	(Y)	D4
Q73	2SB709-Q	(A)	D1
Q74	2SB709-Q	(A)	C2
Q77	2SD601-RS	(Y)	C4
Q78	2SD601-RS	(Y)	C4
Q79	2SA1022-C	(E)	D3
Q80	2SB709-Q	(A)	C2
Q81	2SB709-Q	(A)	C2
Q301	2SK198-Q	(1O)	E6
Q302	2SK198-Q	(1O)	D3
D1	1SV153		B6
D2	1SV153		B4
D3	1SV153		B3
D301	1SV153		F6
D302	1SV153		E4

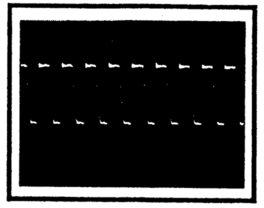
Pin No.	IC301	Pin No.	IC301	Pin No.	IC302	Pin No.	IC302
1	2.4	43	0.8	1	2.4	43	1.0
2	----	44	0	2	2.3	44	0.9
3	-2.1	45	1.9	3	0	45	1.2
4	----	46	0	4	0	46	0.4
5	----	47	2.2	5	0	47	0
6	0.4	48	2.3	6	0	48	0
7	0.4	49	0	7	1.5	49	4.2
8	-0.9	50	2.3	8	0	50	----
9	-0.9	51	0	9	0.3	51	3.0
10	4.8	52	0	10	4.8	52	0
11	4.8	53	-0.1	11	0	53	0
12	0	54	4.8	12	0	54	4.8
13	0	55	-0.1	13	0.5	55	0
14	0	56	4.6	14	-0.4	56	1.9
15	1.1	57	0	15	-1.0	57	4.7
16	0	58	0	16	-1.2	58	3.7
17	0	59	4.6	17	2.8	59	4.7
18	0	60	0.1	18	0	60	3.7
19	1.3	61	0.1	19	2.0	61	0.7
20	1.5	62	0	20	1.1	62	0.7
21	1.8	63	0	21	4.8	63	0
22	1.2	64	4.7	22	0	64	2.3
23	1.1	65	4.7	23	1.4	65	0
24	0	66	4.6	24	1.4	66	2.3
25	0	67	-2.9	25	1.3	67	2.2
26	0	68	-0.7	26	0.6	68	0
27	1.3	69	-0.5	27	2.3	69	1.9
28	1.5	70	-2.2	28	1.9	70	0
29	1.8	71	0.9	29	1.9	71	0.8
30	1.3	72	1.4	30	0	72	0
31	0	73	4.8	31	0	73	4.8
32	0	74	0	32	4.8	74	0
33	4.8	75	0	33	4.8	75	0
34	0.7	76	0.6	34	1.9	76	0
35	----	77	0.1	35	1.9	77	0
36	0	78	0.4	36	1.6	78	0.8
37	0	79	-0.5	37	1.3	79	0
38	----	80	-1.2	38	0.8	80	0
39	0.8	81	-1.2	39	0.9	81	4.8
40	0	82	1.7	40	2.4	82	1.7
41	0	83	1.8	41	1.6	83	1.7
42	0	84	2.4	42	2.0	84	2.0

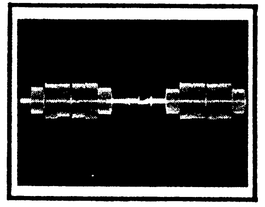
SCHEMATIC DIAGRAM

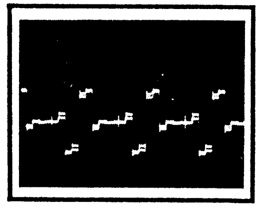

1. 2V/DIV, 10µs/DIV

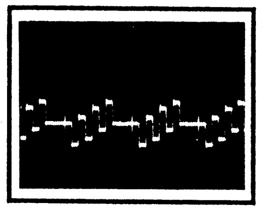

2. 0.1V/DIV, 10µs/DIV

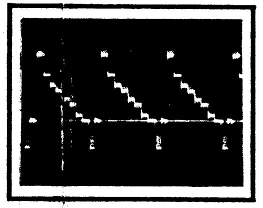

3. 0.1V/DIV, 10µs/DIV

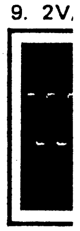

4. 0.2V/DIV, 0.2µs/DIV

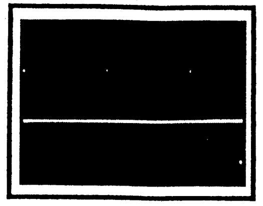

5. 0.1V/DIV, 10µs/DIV

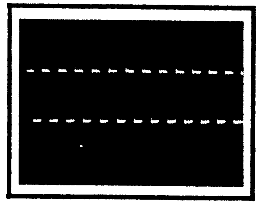

6. 0.5V/DIV, 20µs/DIV

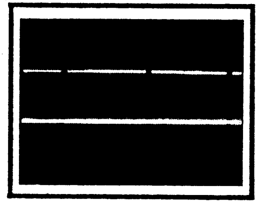

7. 0.5V/DIV, 20µs/DIV

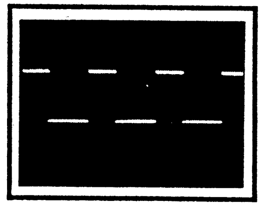

8. 0.5V/DIV, 20µs/DIV

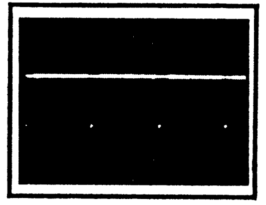

9. 2V

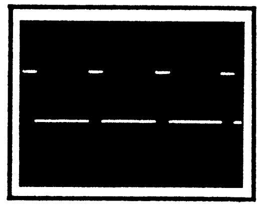

17. 2V/DIV, 5ms/DIV

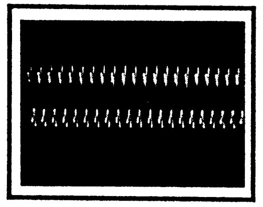

18. 2V/DIV, 0.5µs/DIV

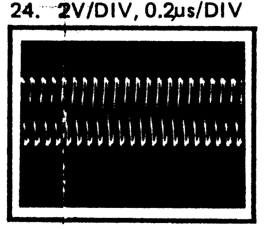

19. 2V/DIV, 5ms/DIV


20. 2V/DIV, 20µs/DIV

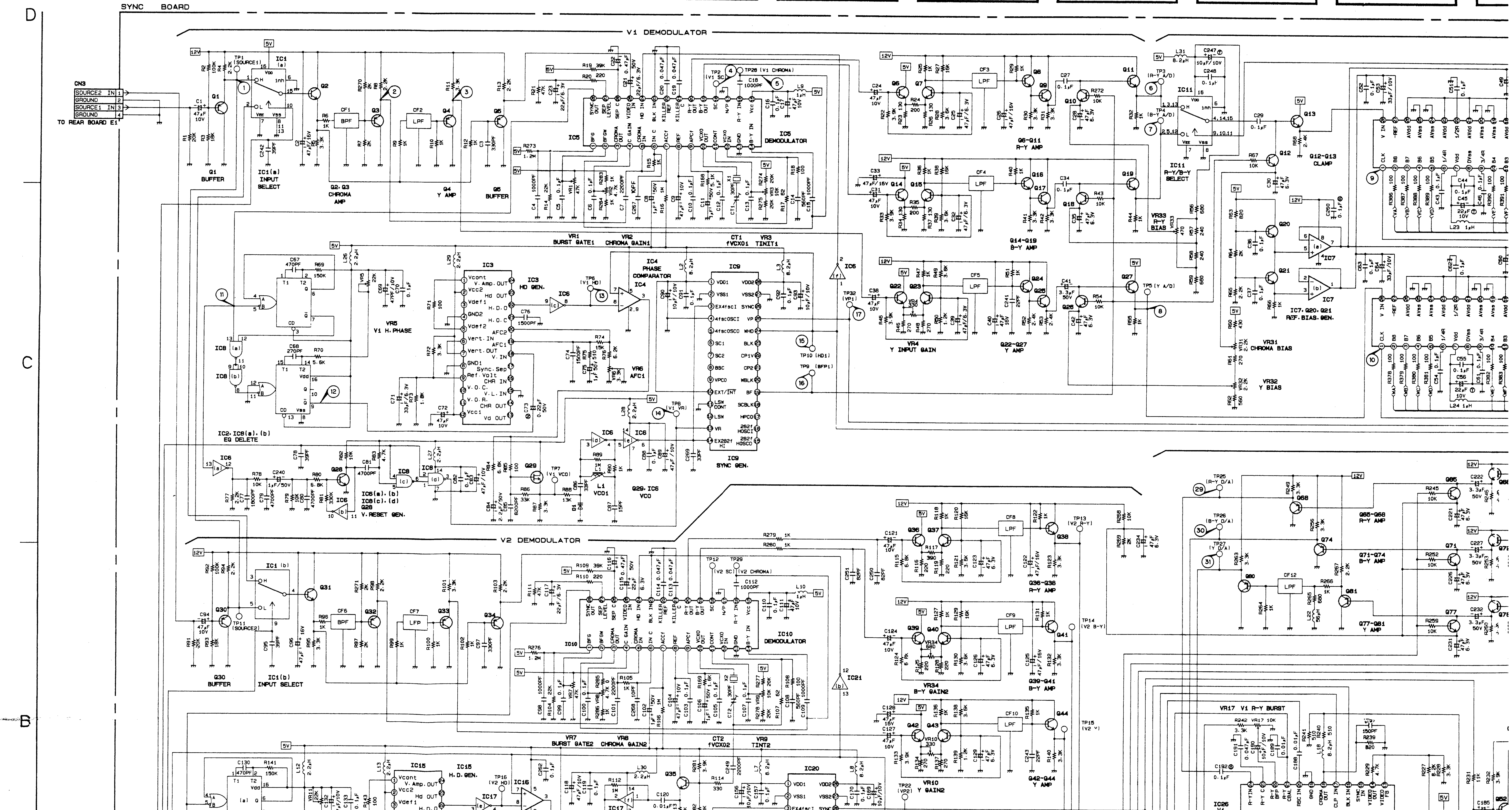

21. 2V/DIV, 20µs/DIV

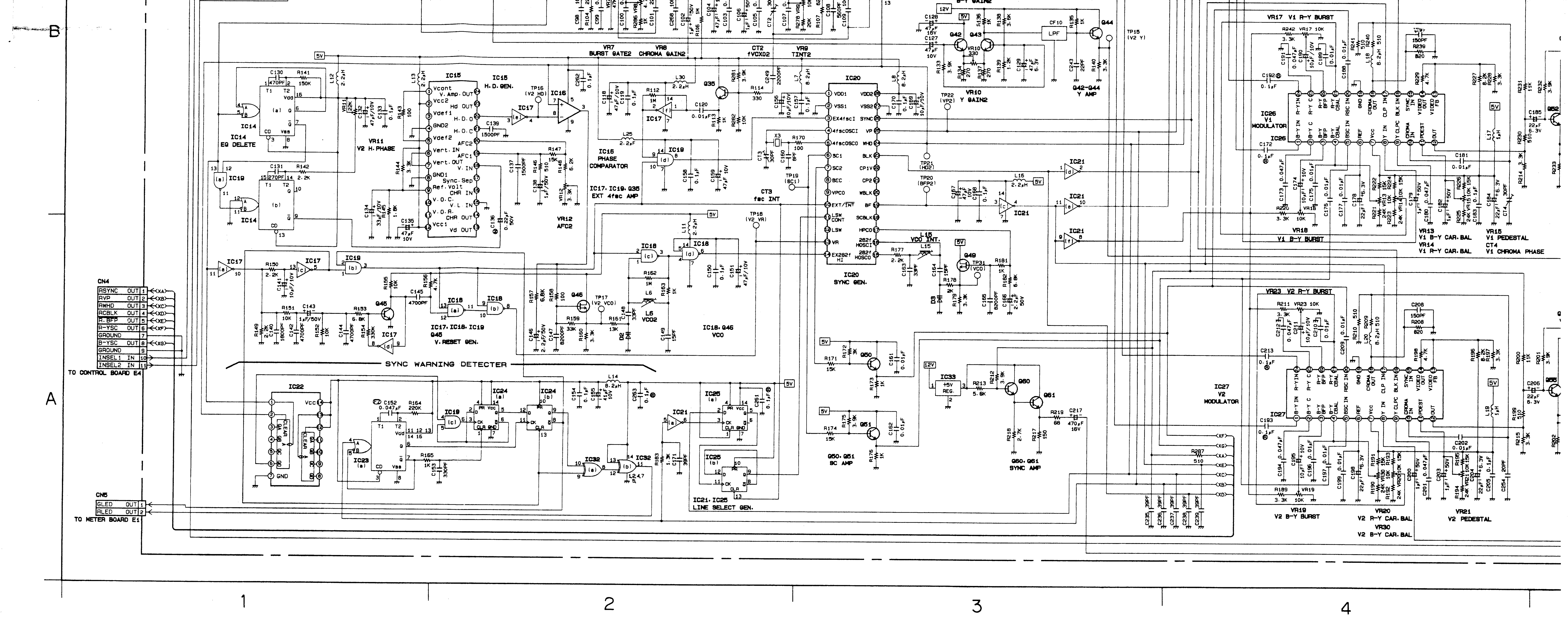

22. 2V/DIV, 20µs/DIV


23. 1V/DIV, 0.1µs/DIV


24. 2V/DIV, 0.2µs/DIV

25. 2


D
C
B
SYNC BOARD
V1 DEMODULATOR
V2 DEMODULATOR
CN3
SOURCE2 IN
GROUND
SOURCE1 IN
GROUND
TO REAR BOARD E1
Q1 BUFFER
IC1(a) INPUT SELECT
Q2, Q3 CHROMA AMP
Q4 Y AMP
Q5 BUFFER
BPF
LPF
CF1
CF2
IC5 DEMODULATOR
VR1 BURST GATE1
VR2 CHROMA GAIN1
CT1 fVCXO1
VR3 TINT1
IC3 HD GEN.
IC4 PHASE COMPARATOR
IC9 SYNC GEN.
VR5 V1 H. PHASE
VR6 AFC1
IC2, IC8(a), (b) EQ DELETE
IC6(a), (b) IC8(c), (d) Q28 V. RESET GEN.
Q29, IC6 VCO
L1 VCO1
TP1 (SOURCE1)
TP2 (V1 SC)
TP28 (V1 CHROMA)
TP6 (V1 HD)
TP7 (V1 VCO)
TP8 (V1 VR)
TP10 (HD1)
TP9 (BFP1)
TP32 (VP1)
Q6-Q11 R-Y AMP
Q14-Q19 B-Y AMP
Q22-Q27 Y AMP
VR4 Y INPUT GAIN
VR33 R-Y BIAS
TP3 (R-Y A/D)
TP4 (B-Y A/D)
TP5 (Y A/D)
IC11 R-Y/B-Y SELECT
Q12-Q13 CLAMP
IC7, Q20, Q21 REF. BIAS. GEN.
VR31 CHROMA BIAS
VR32 Y BIAS
Q30 BUFFER
IC1(b) INPUT SELECT
IC10 DEMODULATOR
VR7 BURST GATE2
VR8 CHROMA GAIN2
CT2 fVCXO2
VR9 TINT2
TP11 (SOURCE2)
TP12 (V2 SC)
TP29 (V2 CHROMA)
TP13 (V2 R-Y)
TP14 (V2 B-Y)
TP15 (V2 Y)
TP16 (V2 HD)
TP22 (VP2)
Q36-Q38 R-Y AMP
Q39-Q41 B-Y AMP
VR34 B-Y GAIN2
Q42-Q44 Y AMP
VR10 Y GAIN2
IC15 H.D. GEN.
IC20
TP25 (R-Y D/A)
TP26 (B-Y D/A)
TP27 (Y D/A)
Q65-Q68 R-Y AMP
Q71-Q74 B-Y AMP
Q77-Q81 Y AMP
VR17 V1 R-Y BURST
IC26


B
A
1
2
3
4
CN4
RSYNC OUT
RVP OUT
RWHD OUT
RCBLK OUT
R.BFP OUT
R-YSC OUT
GROUND
B-YSC OUT
GROUND
INSEL1 IN
INSEL2 IN
TO CONTROL BOARD E4
CN5
GLED OUT
RLED OUT
TO METER BOARD E1
IC14 EQ DELETE
VR11 V2 H.PHASE
IC15 H.D.GEN.
IC16 PHASE COMPARATOR
IC17, IC19, Q35 EXT 4fsc AMP
VR12 AFC2
VR7 BURST GATE2
VR8 CHROMA GAIN2
CT2 fVCXO2
VR9 TINT2
CT3 fsc INT
IC20 SYNC GEN.
VR10 Y GAIN2
Q42-Q44 Y AMP
LPF
TP15 (V2 Y)
TP16 (V2 HD)
TP17 (V2 VCO)
TP18 (V2 VR)
TP19 (SC1)
TP20 (BFP2)
TP21 (HD2)
TP22 (VP2)
L6 VCO2
IC18, Q46 VCO
IC17, IC18, IC19 Q45 V.RESET GEN.
L15 VCO INT.
SYNC WARNING DETECTER
IC21, IC25 LINE SELECT GEN.
Q50, Q51 SC AMP
IC33 +5V REG.
Q60, Q61 SYNC AMP
IC26 V1 MODULATOR
IC27 V2 MODULATOR
VR17 V1 R-Y BURST
VR18 V1 B-Y BURST
VR13 V1 B-Y CAR. BAL
VR14 V1 R-Y CAR. BAL
VR15 V1 PEDESTAL
CT4 V1 CHROMA PHASE
VR23 V2 R-Y BURST
VR19 V2 B-Y BURST
VR20 V2 R-Y CAR. BAL
VR30 V2 B-Y CAR. BAL
VR21 V2 PEDESTAL
5V
12V

Pin No.	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10
1	2.6	0	4.1	—	2.7	0.7	1.4	0	4.7	0
2	2.6	2.4	4.8	0	1.8	4.0	1.4	5.0	0	2.0
3	2.7	4.8	—	2.0	2.1	2.2	1.4	4.8	-4.6	2.1
4	2.7	3.0	0	—	2.3	2.2	0	5.0	0	2.4
5	2.7	4.0	4.1	4.8	2.8	2.2	3.3	4.8	—	2.8
6	0	3.0	0.7	0.8	2.8	-4.6	3.3	0	—	2.8
7	0	1.7	0.7	0.8	4.0	0	3.3	0	—	4.3
8	0	0	0	—	2.8	0.8	11.8	1.7	—	2.9
9	0	4.8	1.8	0	2.8	4.0		3.0	—	0
10	—	—	—		2.6	0		3.0	4.8	2.6
11	0	1.7	—		2.2	4.7		3.0	0	2.2
12	—	0	4.8		3.1	0.3		1.7	—	3.1
13	0	4.8	—		0	4.0		4.0	4.7	0
14	—	4.5	—		2.7	4.8		4.8	-4.6	2.7
15	2.7	.0	0		4.8				—	4.8
16	4.8	4.8	—		2.7				—	2.7
17			—		0				—	0
18			5.1		3.8				—	3.8
19			0		2.0				0.1	2.0
20			2.8		2.0				—	2.0
21			2.9		2.1				—	0
22			4.0		2.6				—	0
23			—		4.0				—	4.0
24			—		4.0				0.7	4.0
25					2.7				0	2.7
26					2.8				—	2.2
27					2.5				0	2.8
28					3.9				4.8	0

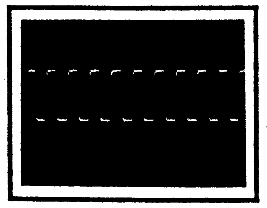
Pin No.	IC11	IC12	IC13	IC14	IC15	IC16	IC17	IC18	IC19	IC20
1	1.8	0.4	0.4	0	4.0	—	2.2	4.8	0	4.8
2	1.8	1.3	1.3	4.7	4.8	—	2.1	0	0	0
3	1.8	1.8	1.8	4.8	—	4.8	4.0	4.8	0	2.1
4	1.8	1.5	1.5	0	0	4.8	0.8	4.8	0	2.2
5	1.8	1.3	1.3	0.1	4.0	—	0	4.8	4.8	2.3
6	0	2.0	2.0	0	0.7	—	—	0	0	2.3
7	0	4.8	4.8	4.7	0.7	0.7	—	0	0	—
8	0	0	0	0	0	0.8	0	4.8	0	—
9	2.1	0	0	4.8	1.8		4.8	0	2.1	0
10	2.1	0	0	—	—		4.7	4.8	0	0
11	2.1	0	0	0	—		0.1	4.8	0	—
12	1.8	0	0	0	4.8		—	4.8	4.7	4.8
13	1.8	1.1	1.1	4.8	—		4.6	0	0.1	0
14	1.8	—	—	4.8	—		4.8	4.8	4.8	2.2
15	1.8	4.8	4.8	0	0					2.2
16	4.8	0	0	4.8	—					1.4
17		3.4	3.4		—					—
18		4.8	4.8		4.1					0.2
19		0	0		0					—
20		0	0		2.0					—
21		4.8	4.8		2.9					—
22		0	0		4.0					1.2
23		4.8	4.8		—					0.7
24		0	0		—					0
25		0	0							4.8
26		4.8	4.8							0
27		1.4	1.4							4.8
28		2.5	2.5							

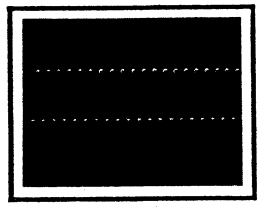
Pin No.	IC21	IC22	IC23	IC24	IC25	IC26	IC27	IC29	IC30	IC31	IC32	IC33
1	1.2	0.1	0	3.4	4.8	2.2	2.2	0	0	0	0	11.8
2	3.6	0.7	3.1	4.8	0.7	1.7	1.7	0.5	1.9	0.9	0	0
3	0.2	—	4.8	0	4.7	2.8	2.8	1.2	1.9	1.4	—	4.8
4	4.8	—	0	4.8	4.8	2.9	2.9	1.2	1.9	0.6	0	
5	0	—	3.4	0	2.3	3.5	3.5	1.3	2.2	0.1	0	
6	4.7	0	1.3	4.8	—	2.9	2.9	1.1	1.6	0.2	—	
7	0	0	3.4	0	0	4.8	4.8	1.9	1.5	-0.8	0	
8	0.2	—	0	4.8	4.8	2.2	2.2	1.4	1.3	-1.5	0	
9	4.8	—	—	0	0	1.7	1.7	2.7	0.6	-1.4	0	
10	0.2	—	—	4.8	4.8	2.9	2.9	0	0	0	0	
11	4.8	—	4.8	1.3	2.3	2.8	2.9	2.7	0.6	-1.4	0	
12	4.0	4.8	4.8	0	4.8	2.3	2.1	1.4	1.3	-1.5	0	
13	1.2	4.8	4.8	0	0	1.8	1.7	1.9	1.5	-0.8	4.8	
14	4.8	4.8	4.8	4.8	4.8	1.7	1.4	1.1	1.6	0.2	4.8	
15			—			—	—	1.3	2.2	0.1		
16			4.8			3.6	3.6	1.2	1.9	0.6		
17						4.6	4.6	1.2	1.9	1.4		
18						3.0	3.0	0.5	1.9	0.9		
19						0	0	0	0	0		
20						3.5	3.5	4.8	4.8	4.8		
21						2.8	2.9					
22						2.8	2.8					
23						1.7	1.7					
24						2.2	2.2					

Pin No.	IC303	IC304	IC305	IC306	IC307	IC308	IC309	IC310
1	0	0	0	0	0	0	0	0
2	-1.2	-1.2	1.4	1.4	-1.2	-1.2	1.4	1.4
3	-1.2	-1.2	0.9	0.9	-1.2	-1.2	0.9	0.9
4	-0.5	-0.5	-2.2	-2.2	-0.5	-0.5	-2.2	-2.2
5	0	0	2.0	-2.9	0	0	2.0	2.0
6	0	0	0.8	0.8	0	0	0.8	0.8
7	-0.2	-0.2	-0.9	-0.9	-0.2	-0.2	0.5	0.5
8	1.2	1.2	0	0	1.2	1.2	1.1	1.1
9	0.8	0.8	0	0	1.1	1.1	0	0
10	1.1	1.1	0	0	0.4	0.4	3.6	3.6
11	0.4	0.4	-0.5	-0.5	0.4	0.4	-0.5	-0.5
12	0.1	0.1	-0.7	-0.7	0.1	0.1	-0.7	-0.7
13	0.6	0.6	-2.9	-2.9	0.6	0.6	-2.9	-2.9
14	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
15	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
16	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
20	4.6	4.6	4.6	4.8	4.6	4.6	4.6	4.6
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
24	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
25	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
26	0	0	0	0	0	0	0	0
27	3.7	4.7	3.7	4.7	3.7	4.7	3.7	4.7
28	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8

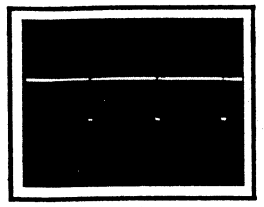
Pin No.	IC311	IC312	IC313	IC314	IC315	IC316	IC317	IC31
1	4.8	4.8	1.9	1.0	1.0	1.0	0	0
2	-0.1	-2.2	-2.2	1.2	1.2	1.2	0	0
3	0	-0.9	-0.9	1.0	1.0	1.0	1.0	1.0
4	0	-1.5	-3.0	1.0	1.0	1.0	1.0	1.0
5	-1.5	-1.8	-1.8	0	0	0	1.0	1.0
6	-0.9	1.1	0	4.2	4.2	4.2	1.2	0.7
7	-0.2	-0.9	-2.8	0	0	0	2.0	1.6
8	1.2	0.9	0	3.0	3.0	3.0	0	0
9	0.9	0.5	3.6	1.2	1.2	1.2	1.0	0.9
10	0	0	0	1.0	1.0	1.0	-3.6	0
11	0	1.9	0.5	1.2	1.2	1.2	1.2	1.0
12	1.8	1.2	0	1.2	1.2	1.2	1.2	1.0
13	0.7	1.8	0	1.2	1.2	1.2	1.2	1.0
14	1.1	0.5	1.1	1.0	1.0	1.2	0	0
15	0.5	.0.7	0	0.7	0.7	0.7	0	0
16	2.0	1.0	4.8	0.5	0.5	0.5	4.8	4.8
17	2.0	2.0		3.0	3.0	3.0		
18	0.8	0		4.8	4.8	4.8		
19	0	1.0		4.2	4.2	4.2		
20	4.8	4.8		0	0	0		
21				1.2	1.2	1.2		
22				0.7	0.7	0.7		
23				1.0	1.0	1.0		
24				1.0	1.0	1.0		

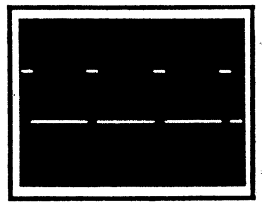
RAM OF SYNC BOARD

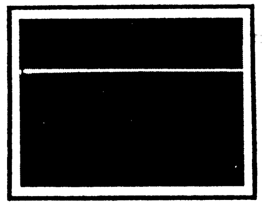
9. 2V/DIV, 0.2µs/DIV


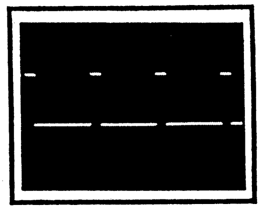
10. 2V/DIV, 0.2µs/DIV


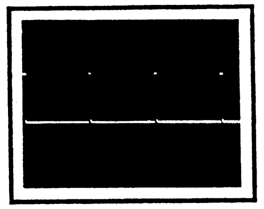
11. 2V/DIV, 20µs/DIV

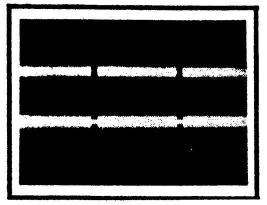
12. 2V/DIV, 20µs/DIV


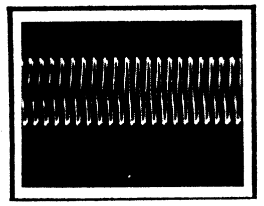
13. 2V/DIV, 20µs/DIV


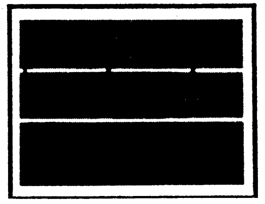
14. 2V/DIV, 5ms/DIV


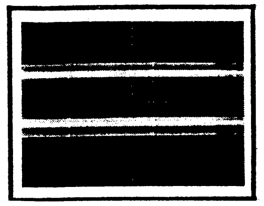
15. 2V/DIV, 20µs/DIV


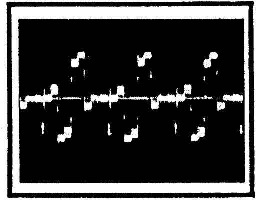
16. 2V/DIV, 20µs/DIV


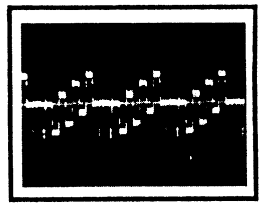
25. 2V/DIV, 5ms/DIV


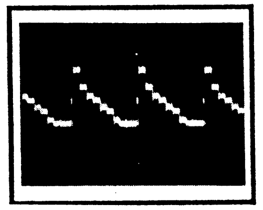
26. 2V/DIV, 0.2µs/DIV


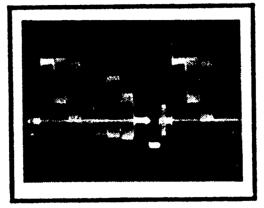
27. 2V/DIV, 5ms/DIV


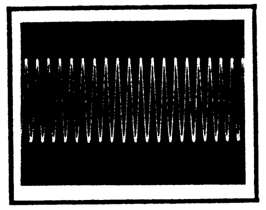
28. 2V/DIV, 5ms/D/V


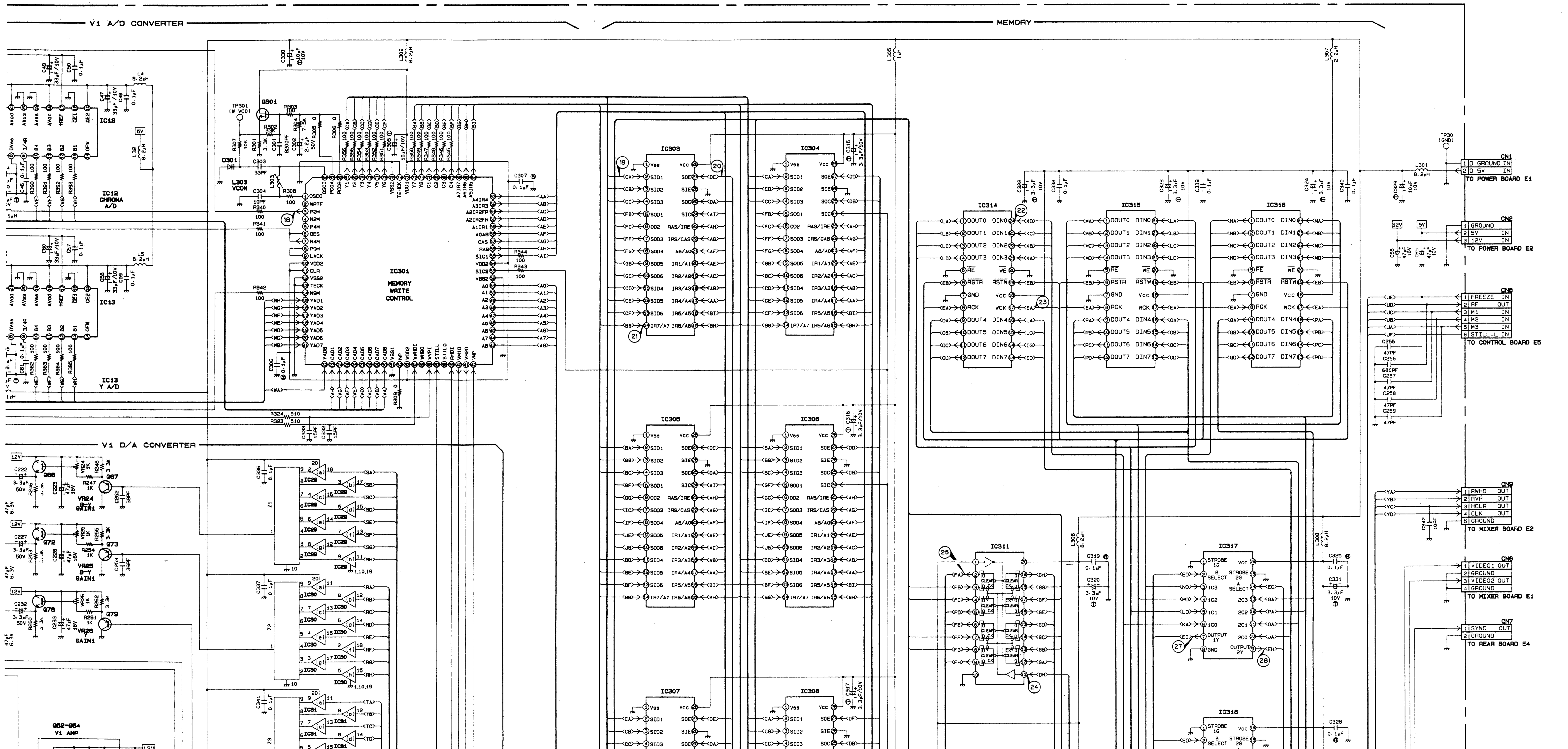
29. 0.2V/DIV, 20µs/DIV


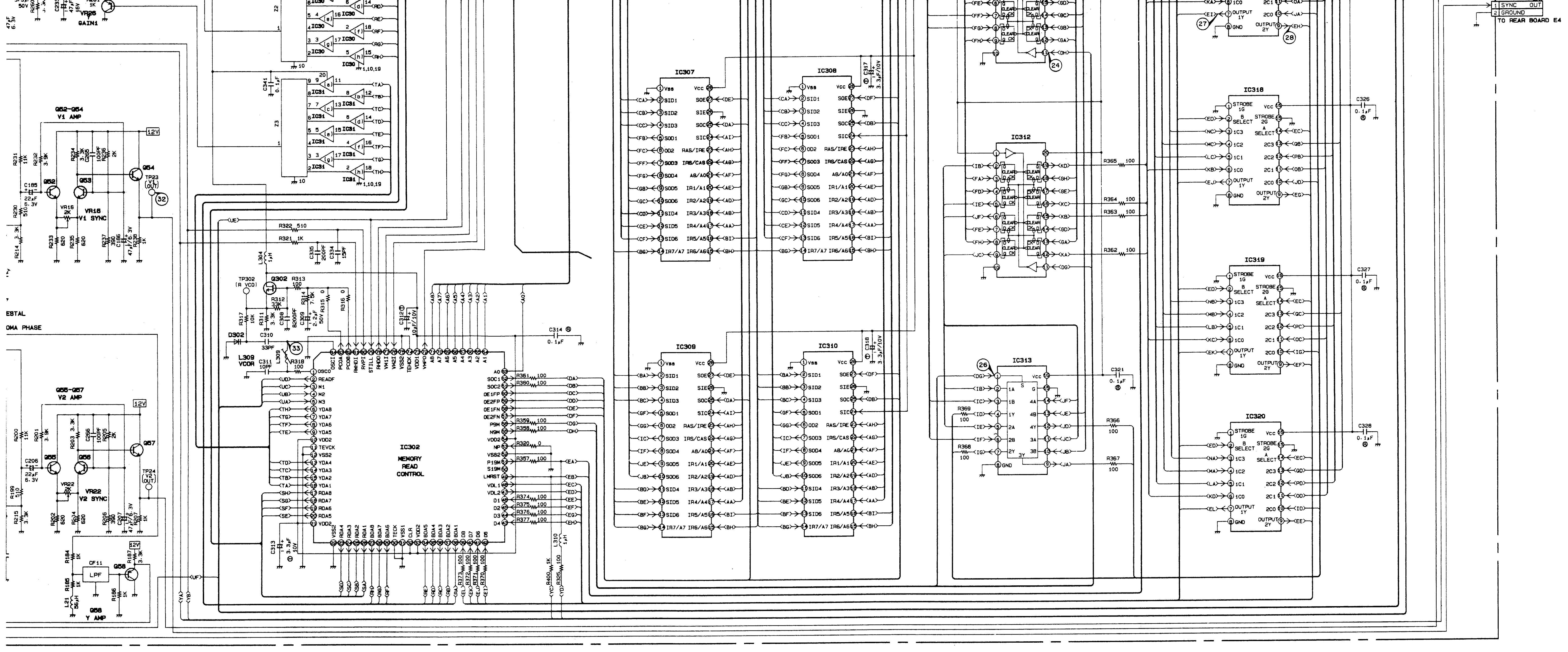
30. 0.2V/DIV, 20µs/DIV


31. 0.1V/DIV, 20µs/DIV


32. 0.5V/DIV, 10µs/DIV


33. 0.5V/DIV, 0.1µs/DIV






C316	IC317	IC318	IC319	IC320
1.0	0	0	0	0
1.2	0	0	0	0
1.0	1.0	1.0	1.2	1.0
1.0	1.0	1.0	1.2	1.0
0	1.0	1.0	1.2	1.0
4.2	1.2	0.7	1.0	1.0
0	2.0	1.6	2.4	0.9
3.0	0	0	0	0
1.2	1.0	0.9	1.2	0.4
1.0	-3.6	0	-2.8	-3.0
1.2	1.2	1.0	1.2	1.2
1.2	1.2	1.0	1.2	1.2
1.2	1.2	1.0	1.2	1.2
1.2	0	0	0	0
0.7	0	0	0	0
0.5	4.8	4.8	4.8	4.8
3.0				
4.8				
4.2				
0				
1.2				
0.7				
1.0				
1.0				

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
B	2.0	2.7	5.9	1.1	2.1	1.9	2.0	6.1	5.7	0.1	2.4	0.1	3.0	1.9	2.0	6.0	5.5
C	0	11.8	0	0	0	4.8	6.1	11.8	11.8	2.4	11.8	3.0	4.8	4.8	6.0	11.8	11.8
E	2.6	2.1	6.6	1.7	2.7	1.2	1.3	5.7	5.0	2.9	1.8	0.1	2.5	1.2	1.3	5.5	4.9

	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34
B	0.1	2.4	4.0	2.1	2.7	2.8	7.1	6.5	0.1	2.5	0	G 1.9	2.0	2.7	5.9	1.1	2.1
C	2.4	11.8	4.8	3.3	4.8	7.1	11.8	11.8	2.5	4.8	4.7	S 2.0	0	11.8	0	0	0
E	2.4	1.8	3.3	1.4	2.1	2.2	6.5	5.9	2.0	1.8	0	D 4.8	2.7	2.0	6.6	1.7	2.7

	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q50	Q51	Q52	Q53	Q54	Q55
B	3.3	1.9	2.0	8.2	1.9	2.0	8.2	2.8	3.0	7.4	0	4.2	4.1	1.8	1.8	5.2	1.8
C	4.8	4.8	8.2	11.8	4.8	8.2	11.8	4.8	7.4	11.8	4.8	4.8	4.8	11.8	5.2	11.8	11.8
E	2.6	1.3	1.4	7.6	1.3	1.4	7.6	2.1	2.1	6.8	0	3.5	3.4	1.1	1.1	4.5	1.1

	Q56	Q57	Q58	Q60	Q61	Q65	Q66	Q67	Q68	Q71	Q72	Q73	Q74	Q77	Q78	Q79	Q80
B	1.9	4.9	2.2	0.8	2.3	2.0	4.1	1.3	9.8	0.1	9.9	1.3	2.1	0.1	9.4	1.3	0.8
C	4.9	11.8	0	0	0	0	2.0	0	11.8	2.0	11.8	0	0	2.3	11.8	0	0
E	1.2	4.2	2.8	1.4	2.8	2.7	2.1	2.0	9.2	2.1	9.2	2.0	2.7	2.0	8.8	2.0	1.4

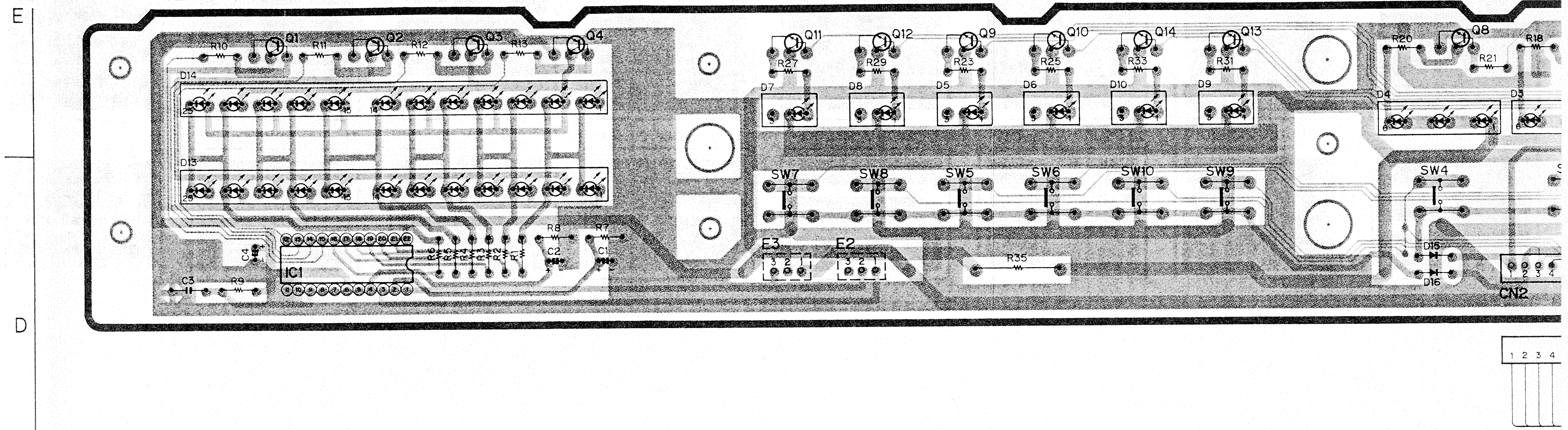
	Q81			Q46	Q49	Q301	Q302
B	2.3		G	4.7	1.4	1.7	1.7
C	0		S	4.5	1.7	2.5	2.0
E	2.8		D	4.8	4.8	4.8	4.8

SYNC BOARD

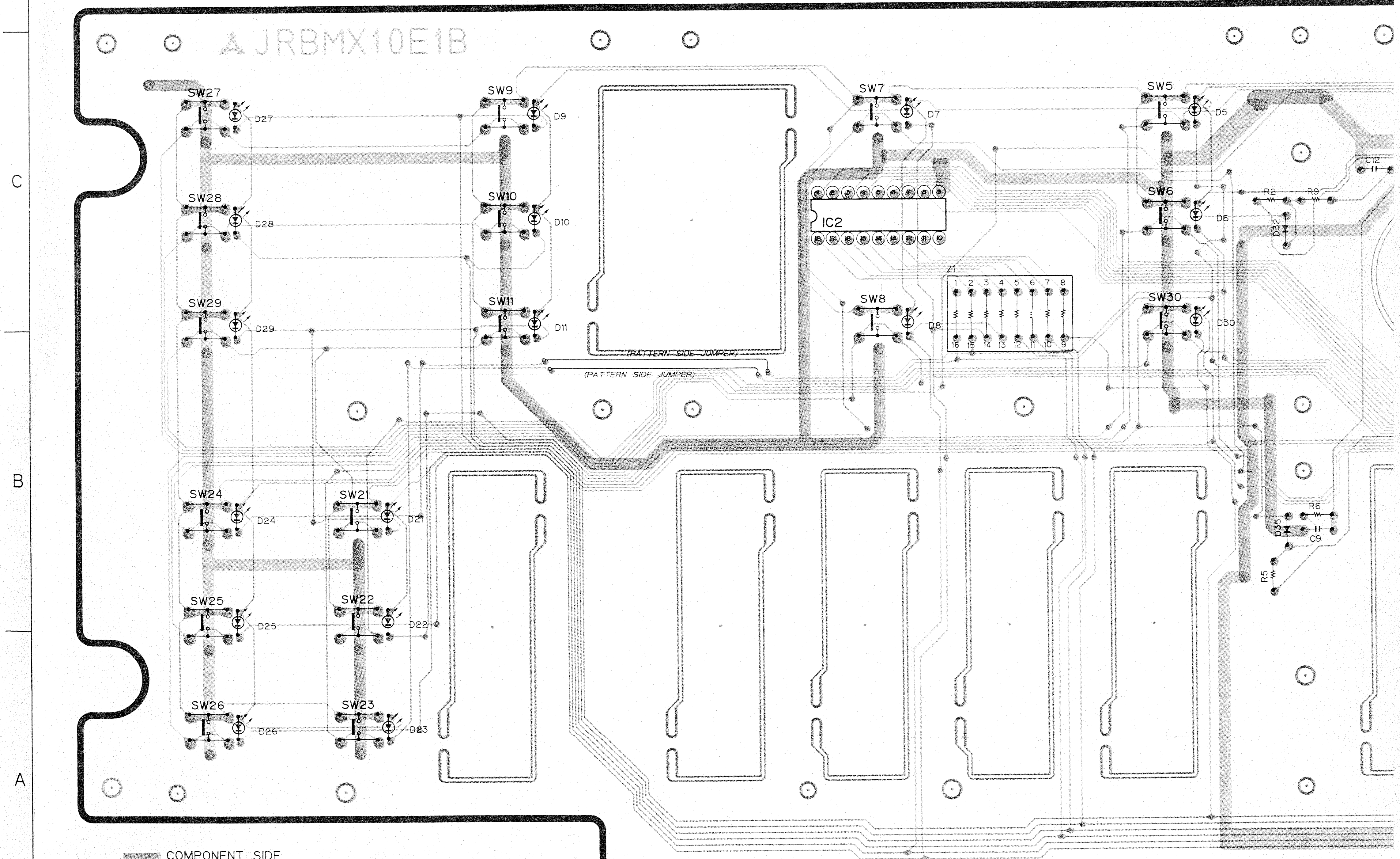
IC1	MN74HC4053S		B1, D1
IC2	MN4528BS		C1
IC3	AN2510S		C2
IC4	TC5081AP		C2
IC5	YWM51271FP		D2
IC6	MN74HC04S		C1, C2, C3
IC7	NJM3414M		C4
IC8	MN74HC00S		C1, C2
IC9	MN676021PPS		C2
IC10	YWM51271FP		B2
IC11	MN74HC4053S		D4
IC12	MP7684		D4
IC13	MP7684		C4
IC14	MN4528BS		B1
IC15	AN2510S		B2
IC16	TC5081AP		B2
IC17	MN74HC04S		A1, B2
IC18	MN74HC00S		A2
IC19	MN74HC08S		A1, B1, A B2
IC20	MN676021PPS		B3
IC21	MN74HC04S		A2, B3
IC22	MN74HC393S		A1
IC23	MN4528BS		A1
IC24	MN74HC74S		A2
IC25	MN74HC74S		A2
IC26	YWM51272FP		B4
IC27	YWM51272FP		A4
IC29	MN74HC245S		B5, C5
IC30	MN74HC245S		B5
IC31	MN74HC245S		B5
IC32	MN74HC86S		A2
IC33	AN78L05		A3
IC301	MN51010LVJ		C5
IC302	MN51015LVK		A5
IC303	YWM5M4C500L		C6
IC304	YWM5M4C500L		C7
IC305	YWM5M4C500L		C6
IC306	YWM5M4C500L		C7
IC307	YWM5M4C500L		B6
IC308	YWM5M4C500L		B7
IC309	YWM5M4C500L		A6
IC310	YWM5M4C500L		A7
IC311	MN74HC273S		C7
IC312	MN74HC273S		C7
IC313	MN74HC157S		C8
IC314	YWPD41102C1S		B7
IC315	YWPD41102C1S		B7
IC316	YWPD41102C1S		A7
IC317	MN74HC153S		B8
IC318	MN74HC153S		B8
IC319	MN74HC153S		A8
IC320	MN74HC153S		A8
Q1	2SB709-Q	(A)	D1
Q2	2SD601-RS	(Y)	D1
Q3	2SB709-Q	(A)	D1
Q4	2SB709-Q	(A)	D2
Q5	2SB709-Q	(A)	D2
Q6	2SD601-RS	(Y)	D3
Q7	2SD601-RS	(Y)	D3
Q8	2SD601-RS	(Y)	D3
Q9	2SD601-RS	(Y)	D3
Q10	2SD601-RS	(Y)	D4
Q11	2SD601-RS	(Y)	D4
Q12	2SD601-RS	(Y)	D4
Q13	2SD601-RS	(Y)	D4
Q14	2SD601-RS	(Y)	C3
Q15	2SD601-RS	(Y)	C3
Q16	2SD601-RS	(Y)	C3
Q17	2SD601-RS	(Y)	C3
Q18	2SD601-RS	(Y)	C4
Q19	2SD601-RS	(Y)	C4
Q20	2SD601-RS	(Y)	C4
Q21	2SD601-RS	(Y)	C4
Q22	2SD601-RS	(Y)	C3
Q23	2SD601-RS	(Y)	C3
Q24	2SD601-RS	(Y)	C3
Q25	2SD601-RS	(Y)	C3
Q26	2SD601-RS	(Y)	C4
Q27	2SD601-RS	(Y)	C4
Q28	2SD601-RS	(Y)	C1
Q29	2SK198-Q	(1O)	C2
Q30	2SB709-Q	(A)	B1
Q31	2SD601-RS	(Y)	B1
Q32	2SB709-Q	(A)	B1
Q33	2SB709-Q	(A)	B2
Q34	2SB709-Q	(A)	B2
Q35	2SC2404-CDTW	(U)	B2
Q36	2SD601-RS	(Y)	B3
Q37	2SD601-RS	(Y)	B3
Q38	2SD601-RS	(Y)	B3
Q39	2SD601-RS	(Y)	B3
Q40	2SD601-RS	(Y)	B3
Q41	2SD601-RS	(Y)	B3
Q42	2SD601-RS	(Y)	B3
Q43	2SD601-RS	(Y)	B3
Q44	2SD601-RS	(Y)	B3
Q45	2SD601-RS	(Y)	A1
Q46	2SK198-Q	(1O)	A2
Q49	2SK198-Q	(1O)	A3
Q50	2SC2404-CDTW	(U)	A3
Q51	2SC2404-CDTW	(U)	A3
Q52	2SC2404-CDTW	(U)	B5
Q53	2SC2404-CDTW	(U)	B5
Q54	2SC2404-CDTW	(U)	B5
Q55	2SC2404-CDTW	(U)	A5
Q56	2SC2404-CDTW	(U)	A5
Q57	2SC2404-CDTW	(U)	A5
Q58	2SB709-Q	(A)	A5
Q60	2SD601-RS	(Y)	A3
Q61	2SD602-QRS	(W)	A3
Q65	2SD601-RS	(Y)	B4
Q66	2SD601-RS	(Y)	B5
Q67	2SB709-Q	(A)	B5
Q68	2SB709-Q	(A)	B4
Q71	2D601-RS	(Y)	B4
Q72	2D601-RS	(Y)	B5
Q73	2SB709-Q	(A)	B4
Q74	2SB709-Q	(A)	B4
Q77	2SD601-RS	(Y)	B4
Q78	2SD601-RS	(Y)	B5
Q79	2SA1022-C	(E)	B5
Q80	2SB709-Q	(A)	B4
Q81	2SB709-Q	(A)	B4
Q301	2SK198-Q	(1O)	D5
Q302	2SK198-Q	(1O)	B5
D1	1SV153		C2
D2	1SV153		A2
D3	1SV153		A3
D301	1SV153		D5
D302	1SV153		A5

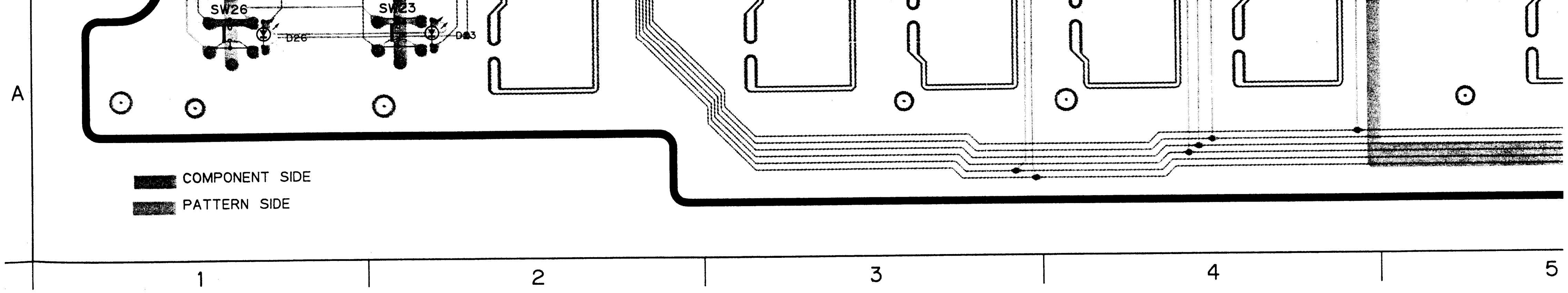
CONDUCTOR VIEW OF METER

METER BOARD

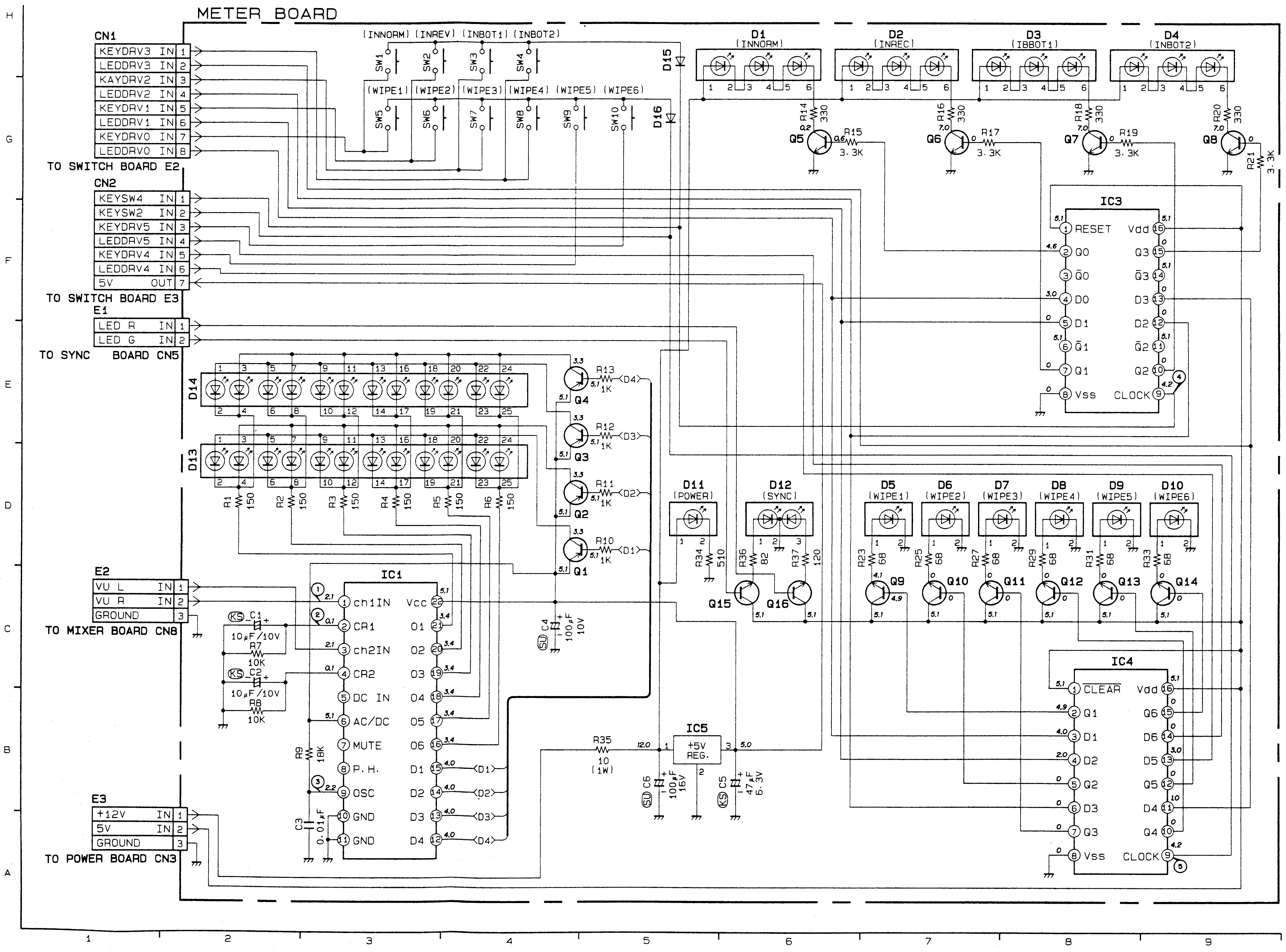

E
D
Q1
Q2
Q3
Q4
R10
R11
R12
R13
D14
D13
IC1
C3
R9
C4
C2
C1
R8
R7
R6
R5
R4
R3
R2
R1
Q11
Q12
Q9
Q10
Q14
Q13
R27
R29
R23
R25
R33
R31
D7
D8
D5
D6
D10
D9
SW7
SW8
SW5
SW6
SW10
SW9
E3
E2
R35
Q8
R20
R18
R21
D4
D3
SW4
D15
D16
CN2
1 2 3 4

SWITCH BOARD


C
B
A
JRBMX10E1B
SW27
D27
SW28
D28
SW29
D29
SW24
D24
SW25
D25
SW26
D26
SW21
D21
SW22
D22
SW23
D23
SW9
D9
SW10
D10
SW11
D11
(PATTERN SIDE JUMPER)
(PATTERN SIDE JUMPER)
SW7
D7
IC2
Z1
SW8
D8
SW5
D5
SW6
D6
SW30
D30
C12
R2
R9
D32
R6
D35
C9
R5
COMPONENT SIDE


SW26
SW23
D26
D23
A
COMPONENT SIDE
PATTERN SIDE
1
2
3
4
5

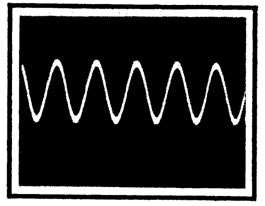
SCHEMATIC DIAGRAM OF METER BOARD


METER BOARD
CN1
KEYDRV3 IN 1
LEDDRV3 IN 2
KAYDRV2 IN 3
LEDDRV2 IN 4
KEYDRV1 IN 5
LEDDRV1 IN 6
KEYDRV0 IN 7
LEDDRV0 IN 8
TO SWITCH BOARD E2
CN2
KEYSW4 IN 1
KEYSW2 IN 2
KEYDRV5 IN 3
LEDDRV5 IN 4
KEYDRV4 IN 5
LEDDRV4 IN 6
5V OUT 7
TO SWITCH BOARD E3
E1
LED R IN 1
LED G IN 2
TO SYNC BOARD CN5
E2
VU L IN 1
VU R IN 2
GROUND 3
TO MIXER BOARD CN8
E3
+12V IN 1
5V IN 2
GROUND 3
TO POWER BOARD CN3
(INNORM) (INREV) (INBOT1) (INBOT2)
SW1 SW2 SW3 SW4
(WIPE1) (WIPE2) (WIPE3) (WIPE4) (WIPE5) (WIPE6)
SW5 SW6 SW7 SW8 SW9 SW10
D15
D16
D1 (INNORM)
D2 (INREC)
D3 (IBBOT1)
D4 (INBOT2)
R14 330
R15 3.3K
R16 330
R17 3.3K
R18 330
R19 3.3K
R20 330
R21 3.3K
Q5 Q6 Q7 Q8
IC3
RESET Vdd
Q0 Q3
Q̄0 Q̄3
D0 D3
D1 D2
Q̄1 Q̄2
Q1 Q2
Vss CLOCK
D14
D13
R13 1K Q4 (D4)
R12 1K Q3 (D3)
R11 1K Q2 (D2)
R10 1K Q1 (D1)
R1 150 R2 150 R3 150 R4 150 R5 150 R6 150
D11 (POWER)
D12 (SYNC)
D5 (WIPE1) D6 (WIPE2) D7 (WIPE3) D8 (WIPE4) D9 (WIPE5) D10 (WIPE6)
R34 510
R36 82
R37 120
R23 68 R25 68 R27 68 R29 68 R31 68 R33 68
Q15 Q16
Q9 Q10 Q11 Q12 Q13 Q14
IC1
ch1IN Vcc
CR1 O1
ch2IN O2
CR2 O3
DC IN O4
AC/DC O5
MUTE O6
P.H. D1
OSC D2
GND D3
GND D4
C1 10μF/10V
R7 10K
C2 10μF/10V
R8 10K
R9 18K
C3 0.01μF
C4 100μF 10V
IC5 +5V REG.
R35 10 (1W)
C6 100μF 16V
C5 47μF 6.3V
IC4
CLEAR Vdd
Q1 Q6
D1 D6
D2 D5
Q2 Q5
D3 D4
Q3 Q4
Vss CLOCK
①
②
③
④
⑤

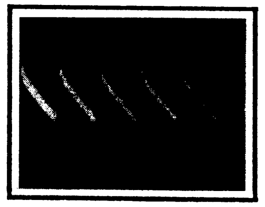
METER BOARD

IC1	YWBA6822S	C3	Q15	2SD636-Q	C6
IC3	MN40175B	F8	Q16	2SD636-Q	C6
IC4	MN40174B	C8	D1	YWLT9230H	H5
IC5	AN78N05	B5	D2	YWLT9230H	H6
Q1	2SB641-QR	D4	D3	YWLT9230H	H7
Q2	2SB641-QR	D4	D4	YWLT9230H	H8
Q3	2SB641-QR	D4	D5	YWLT9000N	D7
Q4	2SB641-QR	E4	D6	YWLT9000N	D7
Q5	2SD636-Q	G6	D7	YWLT9000N	D7
Q6	2SD636-Q	G7	D8	YWLT9000N	D8
Q7	2SD636-Q	G8	D9	YWLT9000N	D8
Q8	2SD636-Q	G9	D10	YWLT9000N	D9
Q9	2SD636-Q	C7	D11	YWLT9000D	D5
Q10	2SD636-Q	C7	D12	YWLT9002ND	D6
Q11	2SD636-Q	C7	D13	YWGL112F13	D2
Q12	2SD636-Q	C8	D14	YWGL112F13	D4
Q13	2SD636-Q	C8	D15	MA165	G5
Q14	2SD636-Q	C9	D16	MA165	H5

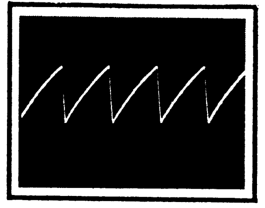
1. 50mV/DIV, 0.5ms/DIV



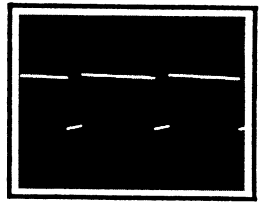
2. 5mV/DIV, 0.5ms/DIV



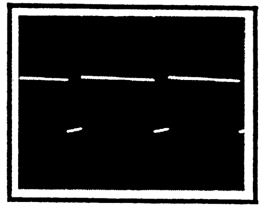
3. 0.5V/DIV, 50μs/DIV

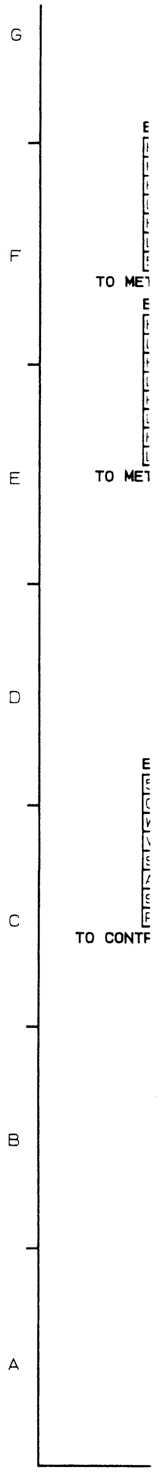


4. 2V/DIV, 5ms/DIV

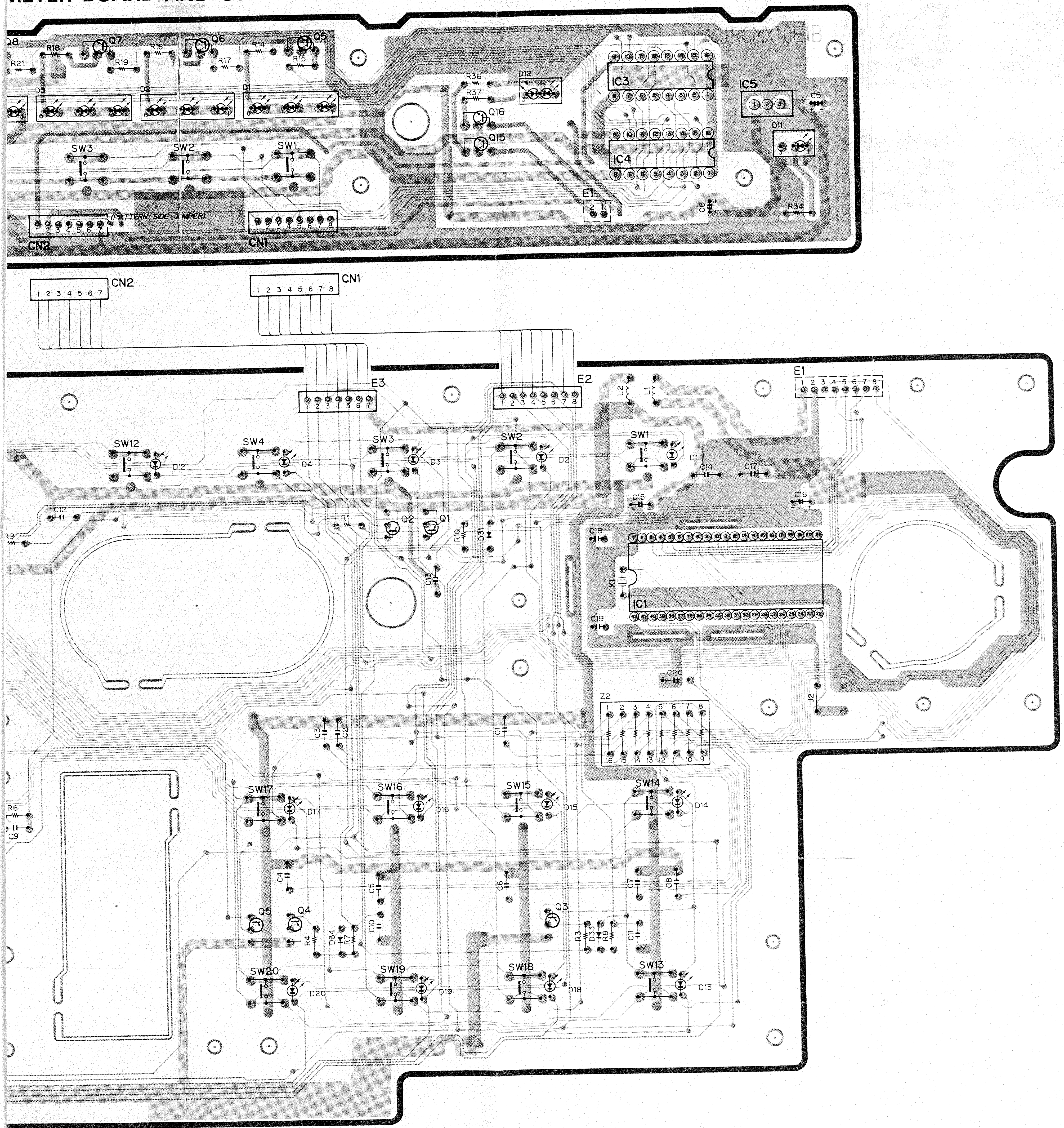


5. 2V/DIV, 5ms/DIV





METER BOARD AND SWITCH BOARD

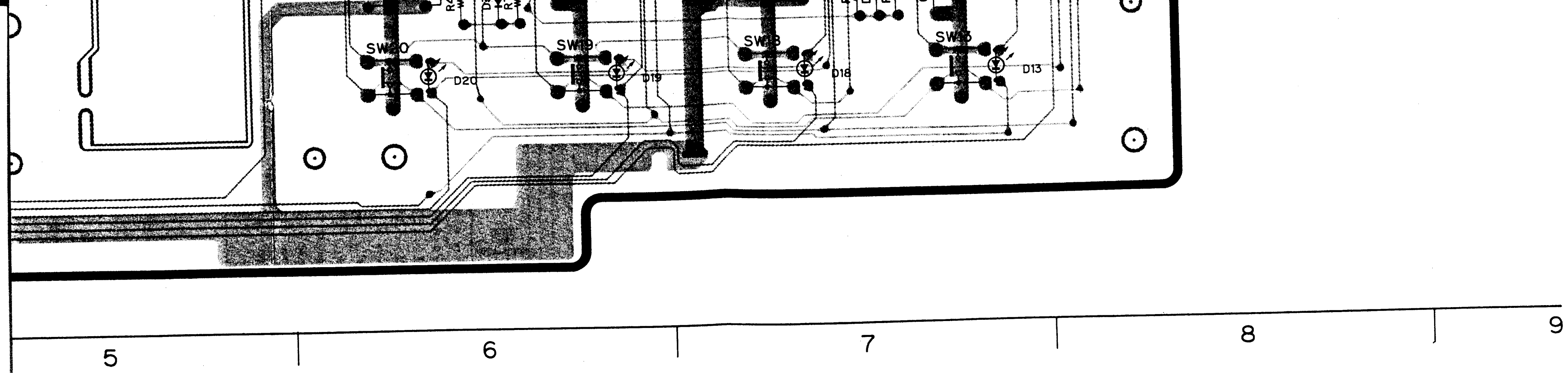

AJRCMX10E1B
(PATTERN SIDE JUMPER)
CN1
CN2
E1
E2
E3
IC1
IC3
IC4
IC5
X1
Z2
J2
L1
L2
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q15
Q16
SW1
SW2
SW3
SW4
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
D1
D2
D3
D4
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D31
D33
D34
R1
R3
R4
R6
R7
R8
R10
R14
R15
R16
R17
R18
R19
R21
R34
R36
R37
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20

METER BOARD

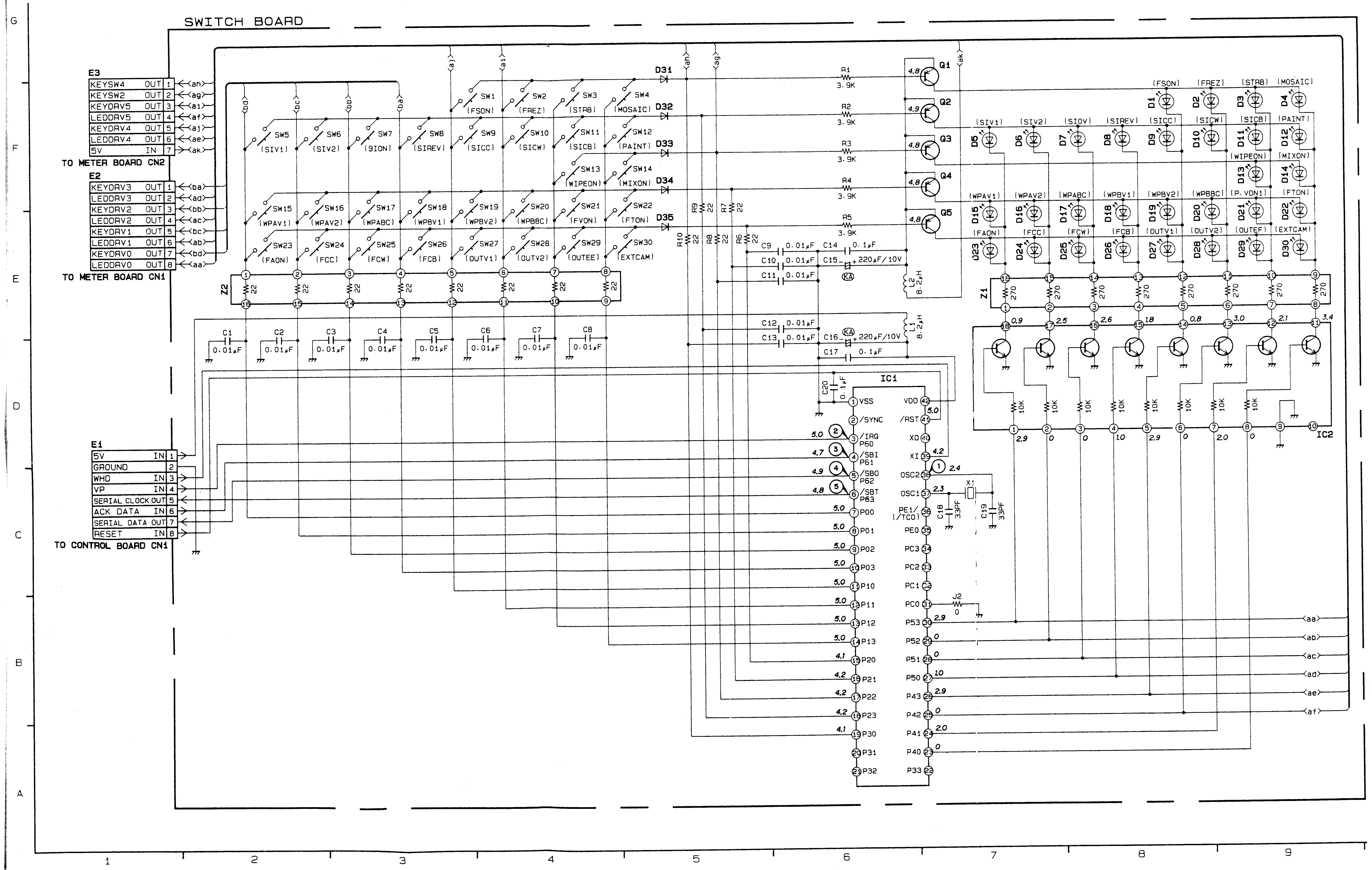
IC1	YWBA6822S	D1
IC3	MN40175B	D7
IC4	MN40174B	D7
IC5	AN78N05	D8
Q1	2SB641-QR	E1
Q2	2SB641-QR	E1
Q3	2SB641-QR	E2
Q4	2SB641-QR	E2
Q5	2SD636-Q	E6
Q6	2SD636-Q	E6
Q7	2SD636-Q	E5
Q8	2SD636-Q	E5
Q9	2SD636-Q	E3
Q10	2SD636-Q	E4
Q11	2SD636-Q	E3
Q12	2SD636-Q	E3
Q13	2SD636-Q	E4
Q14	2SD636-Q	E4
Q15	2SD636-Q	D7
Q16	2SD636-Q	D7
D1	YWLT9230H	E6
D2	YWLT9230H	E5
D3	YWLT9230H	E5
D4	YWLT9230H	E5
D5	YWLT9000N	E3
D6	YWLT9000N	E4
D7	YWLT9000N	E3
D8	YWLT9000N	E3
D9	YWLT9000N	E4
D10	YWLT9000N	E4
D11	YWLT9000D	D8
D12	YWLT9002ND	E7
D13	YWGL112F13	E1
D14	YWGL112F13	D1
D15	MA165	D5
D16	MA165	D5

SWITCH BOARD

IC1	MN15542CCE1	C7
IC2	AN90B20	C3
Q1	2SB641-QR	C6
Q2	2SB641-QR	C6
Q3	2SB641-QR	A7
Q4	2SB641-QR	A6
Q5	2SB641-QR	A6
D1	YWGL1HS211	C7
D2	YWGL1HS211	C7
D3	YWGL1HS211	C6
D4	YWGL1HS211	C6
D5	YWGL1HS211	C4
D6	YWGL1HS211	C4
D7	YWGL1HS211	C3
D8	YWGL1HS211	C3
D9	YWGL1HS211	C2
D10	YWGL1HS211	C2
D11	YWGL1HS211	C2
D12	YWGL1HS211	C5
D13	YWGL1HS211	A7
D14	YWGL1HS211	B7
D15	YWGL1HS211	B7
D16	YWGL1HS211	B6
D17	YWGL1HS211	B6
D18	YWGL1HS211	A7
D19	YWGL1HS211	A6
D20	YWGL1HS211	A6
D21	YWGL1HS211	B2
D22	YWGL1HS211	A2
D23	YWGL1HS211	A2
D24	YWGL1HS211	B1
D25	YWGL1HS211	B1
D26	YWGL1HS211	A1
D27	YWGL1HS211	C1
D28	YWGL1HS211	C1
D29	YWGL1HS211	C1
D30	YWGL1HS211	C4
D31	MA165	C7
D32	MA165	C5
D33	MA165	A7
D34	MA165	A6
D35	MA165	B5


SW20
SW19
SW18
SW15
D20
D19
D18
D13
5
6
7
8
9

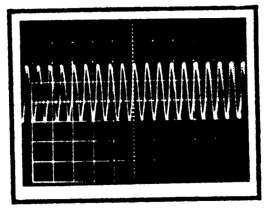
SCHEMATIC DIAGRAM OF SWITCH BOARD


SWITCH BOARD
E3
KEYSW4 OUT 1
KEYSW2 OUT 2
KEYDRV5 OUT 3
LEDDRV5 OUT 4
KEYDRV4 OUT 5
LEDDRV4 OUT 6
5V IN 7
TO METER BOARD CN2
E2
KEYDRV3 OUT 1
LEDDRV3 OUT 2
KEYDRV2 OUT 3
LEDDRV2 OUT 4
KEYDRV1 OUT 5
LEDDRV1 OUT 6
KEYDRV0 OUT 7
LEDDRV0 OUT 8
TO METER BOARD CN1
E1
5V IN 1
GROUND 2
WHD IN 3
VP IN 4
SERIAL CLOCK OUT 5
ACK DATA IN 6
SERIAL DATA OUT 7
RESET IN 8
TO CONTROL BOARD CN1
SW1 (FSON)
SW2 (FREZ)
SW3 (STRB)
SW4 (MOSAIC)
SW5 (SIV1)
SW6 (SIV2)
SW7 (SION)
SW8 (SIREV)
SW9 (SICC)
SW10 (SICW)
SW11 (SICB)
SW12 (PAINT)
SW13 (WIPEON)
SW14 (MIXON)
SW15 (WPAV1)
SW16 (WPAV2)
SW17 (WPABC)
SW18 (WPBV1)
SW19 (WPBV2)
SW20 (WPBBC)
SW21 (FVON)
SW22 (FTON)
SW23 (FAON)
SW24 (FCC)
SW25 (FCW)
SW26 (FCB)
SW27 (OUTV1)
SW28 (OUTV2)
SW29 (OUTEE)
SW30 (EXTCAM)
D31
D32
D33
D34
D35
R1 3.9K
R2 3.9K
R3 3.9K
R4 3.9K
R5 3.9K
Q1
Q2
Q3
Q4
Q5
C9 0.01μF
C10 0.01μF
C11 0.01μF
C12 0.01μF
C13 0.01μF
C14 0.1μF
C15 220μF/10V
C16 220μF/10V
C17 0.1μF
C20 0.1μF
L1 8.2μH
L2 8.2μH
Z1
Z2
C1 0.01μF
C2 0.01μF
C3 0.01μF
C4 0.01μF
C5 0.01μF
C6 0.01μF
C7 0.01μF
C8 0.01μF
IC1
VSS
/SYNC
/IRQ P60
/SBI P61
/SBO P62
/SBT P63
P00
P01
P02
P03
P10
P11
P12
P13
P20
P21
P22
P23
P30
P31
P32
VDD
/RST
XO
XI
OSC2
OSC1
PE1/(/TCO)
PE0
PC3
PC2
PC1
PC0
P53
P52
P51
P50
P43
P42
P41
P40
P33
X1
C18 33PF
C19 33PF
J2 0
IC2
D1 (FSON)
D2 (FREZ)
D3 (STRB)
D4 (MOSAIC)
D5 (SIV1)
D6 (SIV2)
D7 (SIOV)
D8 (SIREV)
D9 (SICC)
D10 (SICW)
D11 (SICB)
D12 (PAINT)
D13 (WIPEON)
D14 (MIXON)
D15 (WPAV1)
D16 (WPAV2)
D17 (WPABC)
D18 (WPBV1)
D19 (WPBV2)
D20 (WPBBC)
D21 (P.VON1)
D22 (FTON)
D23 (FAON)
D24 (FCC)
D25 (FCW)
D26 (FCB)
D27 (OUTV1)
D28 (OUTV2)
D29 (OUTEF)
D30 (EXTCAM)
1
2
3
4
5
6
7
8
9

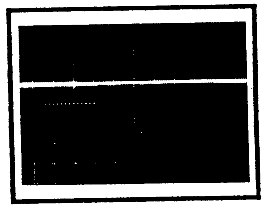
SWITCH BOARD

IC1	MN15542CCE1	D6
IC2	AN90B20	D9
Q1	2SB641-QR	F6
Q2	2SB641-QR	F6
Q3	2SB641-QR	F6
Q4	2SB641-QR	E6
Q5	2SB641-QR	E6
D1	YWGL1HS211	F8
D2	YWGL1HS211	F9
D3	YWGL1HS211	F9
D4	YWGL1HS211	F9
D5	YWGL1HS211	F7
D6	YWGL1HS211	F7
D7	YWGL1HS211	F8
D8	YWGL1HS211	F8
D9	YWGL1HS211	F8
D10	YWGL1HS211	F9
D11	YWGL1HS211	F9
D12	YWGL1HS211	F9
D13	YWGL1HS211	F9
D14	YWGL1HS211	F9
D15	YWGL1HS211	E7
D16	YWGL1HS211	E7
D17	YWGL1HS211	E8
D18	YWGL1HS211	E8
D19	YWGL1HS211	E8
D20	YWGL1HS211	E9
D21	YWGL1HS211	E9
D22	YWGL1HS211	E9
D23	YWGL1HS211	E7
D24	YWGL1HS211	E7
D25	YWGL1HS211	E8
D26	YWGL1HS211	E8
D27	YWGL1HS211	E8
D28	YWGL1HS211	E9
D29	YWGL1HS211	E9
D30	YWGL1HS211	E9
D31	MA165	F5
D32	MA165	F5
D33	MA165	F5
D34	MA165	E5
D35	MA165	E5

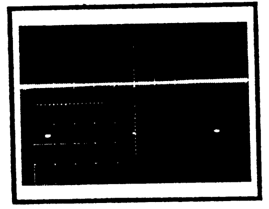
1. 2V/DIV, 0.2μs/DIV



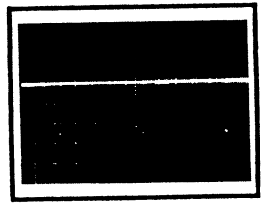
2. 2V/DIV, 5ms/DIV



3. 2V/DIV, 1ms/DIV



4. 2V/DIV, 5ms/DIV



5. 2V/DIV, 1ms/DIV